



# ASIATIC RESEARCHES;

OR,

## TRANSACTIONS

OF THE

SOCIETY,

*INSTITUTED IN BENGAL,*

FOR INQUIRING INTO THE

HISTORY AND ANTIQUITIES, THE ARTS, SCIENCES,  
AND LITERATURE,

OF

A S I A.

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*VOLUME THE FIRST.*

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*Printed verbatim from the Calcutta Edition.*

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1799.





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## THE INTRODUCTION.

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*IF this first publication of the ASIATICK SOCIETY should not answer those expectations, which may have been hastily formed by the learned in Europe, they will be candid enough to consider the disadvantages, which must naturally have attended its institution and retarded its progress: a mere man of letters, retired from the world and allotting his whole time to philosophical or literary pursuits, is a character unknown among Europeans resident in India, where every individual is a man of business in the civil or military state, and constantly occupied either in the affairs of government, in the administration of justice, in some department of revenue or commerce, or in one of the liberal professions; very few hours, therefore, in the day or night can be reserved for any study, that has no immediate connection with business, even by those who are most habituated to mental application; and it is impossible to preserve health in Bengal without regular exercise and seasonable relaxation of mind; not to insist, that, in the opinion of an illustrious Roman, "No one can be said to enjoy liberty, who has not sometimes the privilege of doing nothing." All employments, however, in all countries afford some intervals of leisure; and there is an active spirit in European minds, which no climate or situation in life can wholly repress, which justifies the ancient notion, that a change of toil is a species of repose, and which seems to consider nothing done or learned, while any thing remains unperformed or unknown: several Englishmen, therefore, who resided in a country, every part of which abounds in objects of curious and useful speculation, concurred in*  
a 2 *opinion,*

*opinion, that a Society instituted at Calcutta, on the plan of those established in the principal cities of Europe, might possibly be the means of concentrating all the valuable knowledge, which might occasionally be attained in Asia, or of preserving at least many little tracts and essays, the writers of which might not think them of sufficient importance for separate publication. The ASIATIC SOCIETY was accordingly formed on the 15th of January 1784, by those Gentlemen, whose names are distinguished by asterisks in the list of Members at the end of this book; and ample materials have already been collected for two large volumes on a variety of new and interesting subjects. By this publication the institution may be considered as having taken root; but the plant will flourish or fade, according as the activity or remissness of the Members and their correspondents shall promote or obstruct its growth: it will flourish, if naturalists, chymists, antiquaries, philologers, and men of science, in different parts of Asia, will commit their observations to writing, and send them to the President or the Secretary at Calcutta; it will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease; for it is morally impossible, that a few men, whatever be their zeal, who have great public duties to discharge, and difficult private studies connected with those duties, can support such an establishment without the most assiduous and eager auxiliaries.*

*Before we proceed to give a short history of the institution, it may be proper to declare, that the Society will pass no decision in their collective capacity on any point of literature or philosophy, but that the writers of such dissertations, as they shall think worthy to be published from time to time, must hold themselves individually responsible for their own opinions; a declaration, which is conformable, we believe, to the practice of similar Societies in Europe.*

*It having been resolved to follow, as nearly as possible, the plan of the Royal Society at London, of which the King is Patron, it was agreed at the first regular meeting, that the Letter here exhibited should be sent to the Governor General and Council, as the Executive power in the Company's territories ; and their answer, which is also subjoined, was received in the course of the next month.*

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*To the Honourable WARREN HASTINGS, Esq. Governor General, President ;  
EDWARD WHELER, JOHN MACPHERSON, and JOHN STABLES,  
ESQUIRES, Members of the Council of Fort William in Bengal.*

HONOURABLE SIR AND GENTLEMEN,

**A** SOCIETY, of which we are Members, having been instituted for the purpose of inquiring into the History Civil and Natural, the Antiquities, Arts, Sciences, and Literature of *Asia*, we are desirous, that you will honour us with accepting the title of our *Patrons*, and request you to consider this application as a token of the great respect, with which we are,

HONOURABLE SIR AND GENTLEMEN,

Your most obedient and most humble Servants,

JOHN HYDE,  
WILLIAM JONES,  
JOHN CARNAC,  
DAVID ANDERSON,  
WILLIAM CHAMBERS,  
FRANCIS GLADWIN,  
JONATHAN DUNCAN,

THOMAS LAW,  
CHARLES WILKINS,  
JOHN DAVID PATERSON,  
CHARLES CHAPMAN,  
CHARLES HAMILTON,  
GEORGE HILARIO BARLOW.

*Calcutta, January 22, 1784.*

## THE ANSWER.

GENTLEMEN,

WE very much approve and applaud your endeavours to promote the extension of knowledge by the means, which your local advantages afford you in a degree, perhaps, exceeding those of any part of the *Globe*; and we derive great hopes of your attainment of so important an end from our personal knowledge of the abilities and talents of the Gentlemen, whose names we read in the subscription to your address.

We accept the title you have been desirous of conferring upon us of *Patrons* to your Society, and shall be happy to avail ourselves of any occasion that may occur of contributing to its success.

We are, GENTLEMEN,

Your most obedient humble Servants,

WARREN HASTINGS,  
EDWARD WHEELER,  
JOHN MACPHERSON,  
JOHN STABLES.

*Mr. HASTINGS therefore appeared, as Governor General, among the Patrons of the new Society ; but he seemed, in his private station, as the first liberal promoter of useful knowledge in Bengal, and especially as the great encourager of Persian and Sanscrit literature, to deserve a particular mark of distinction ; and he was accordingly requested in a short letter to accept the title of President : it was, indeed, much doubted, whether he would accept any office, the duties of which he could not have leisure to fulfil ; but an offer of the honorary title was intended as a tribute of respect, which the occasion seemed to demand, and which could not have been omitted without an appearance of inattention to his distinguished merit. His answer is also annexed.*

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GENTLEMEN,

**I** AM highly sensible of the honor, which you have been pleased to confer upon me, in nominating me to be the President of your Society, and I hope you will both admit and approve the motives, which impel me to decline it.

From an early conviction of the utility of the institution, it was my anxious wish that I might be, by whatever means, instrumental in promoting the success of it ; but not in the mode which you have proposed, which, I fear, would rather prove, if of any effect, an incumbrance on it.

I have not the leisure requisite to discharge the functions of such a station ; nor, if I did possess it, would it be consistent with the pride, which every man may be allowed to avow in the pursuit or support of the objects of his personal credit, to accept the first station in a department, in which the superior talents of my immediate followers in it would shine with a lustre, from which mine must suffer much

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in the comparison, and to stand in so conspicuous a point of view the only ineffective member of a body, which is yet in its infancy, and composed of Members with whose abilities I am, and have long been, in the habits of intimate communication, and know them to be all eminently qualified to fill their respective parts in it.

On these grounds I request your permission to decline the offer which you have done me the honor to make to me, and to yield my pretensions to the Gentleman, whose genius planned the institution, and is most capable of conducting it to the attainment of the great and splendid purposes of its formation.

I at the same time earnestly solicit your acceptance of services in any way in which they can be, and I hope that they may be, rendered useful to your Researches.

I have the honor to be,

GENTLEMEN,

Your most obedient and most humble Servant,

*Fort William,  
January 30, 1784.*

WARREN HASTINGS.

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*On the receipt of this letter, Sir WILLIAM JONES was nominated President of the Society; and, at their next meeting, he delivered the following discourse.*

*A DISCOURSE*

*D I S C O U R S E*  
ON THE  
INSTITUTION OF A SOCIETY,  
FOR INQUIRING INTO THE  
HISTORY, CIVIL AND NATURAL,  
THE ANTIQUITES, ARTS, SCIENCES, AND LITERATURE.  
OF  
A S I A.  
BY THE PRESIDENT.

GENTLEMEN,

WHEN I was at sea, last August, on my voyage to this country, which I had long and ardently desired to visit, I found, one evening, on inspecting the observations of the day, that *India* lay before us, and *Persia* on our left, whilst a breeze from *Arabia* blew nearly on our stern. A situation so pleasing in itself, and to me so new, could not fail to awaken a train of reflections in a mind, which had early been accustomed to contemplate with delight the eventful histories and agreeable fictions of this eastern world. It gave me inexpressible pleasure to find myself in the midst of so noble an amphitheatre, almost encircled by the vast regions of *Asia*, which has ever been esteemed the nurse of sciences, the inventress of delightful and useful arts, the scene of glorious actions, fertile in the

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productions of human genius, abounding in natural wonders, and infinitely diversified in the forms of religion and government, in the laws, manners, customs, and languages, as well as in the features and complexions, of men. I could not help remarking, how important and extensive a field was yet unexplored, and how many solid advantages unimproved; and, when I considered with pain, that, in this fluctuating, imperfect, and limited condition of life, such inquiries and improvements could only be made by the united efforts of many, who are not easily brought, without some pressing inducement or strong impulse, to converge in a common point, I consoled myself with a hope founded on opinions, which it might have the appearance of flattery to mention, that, if in any country or community such an union could be effected, it was among my countrymen in *Bengal*, with some of whom I already had, and with most was desirous of having, the pleasure of being intimately acquainted.

You have realized that hope, gentlemen, and even anticipated a declaration of my wishes, by your alacrity in laying the foundation of a society for inquiring into the history and antiquities, the natural productions, arts, sciences, and literature of *Asia*. I may confidently foretel, that an institution so likely to afford entertainment, and convey knowledge, to mankind, will advance to maturity by slow, yet certain, degrees; as the Royal Society, which at first was only a meeting of a few literary friends at *Oxford*, rose gradually

dually to that splendid zenith, at which a HALLEY was their secretary, and a NEWTON their president.

Although it is my humble opinion, that, in order to ensure our success and permanence, we must keep a middle course between a languid remissness, and an over zealous activity, and that the tree, which you have auspiciously planted, will produce fairer blossoms and more exquisite fruit, if it be not at first exposed to too great a glare of sunshine, yet I take the liberty of submitting to your consideration a few general ideas on the plan of our society; assuring you, that, whether you reject or approve them, your correction will give me both pleasure and instruction, as your flattering attentions have already conferred on me the highest honour.

It is your design, I conceive, to take an ample space for your learned investigations, bounding them only by the geographical limits of *Asia*; so that, considering *Hindustan* as a centre, and turning your eyes in idea to the North, you have, on your right, many important kingdoms in the Eastern peninsula, the ancient and wonderful empire of *China* with all her *Tartarian* dependencies, and that of *Japan*, with the cluster of precious islands, in which many singular curiosities have too long been concealed: before you lies that prodigious chain of mountains, which formerly perhaps were a barrier against the violence of the sea, and beyond them the very interesting country of *Tibet*, and the vast regions of *Tar-*

*tary*, from which, as from the *Trojan* horde of the poets, have issued so many consummate warriors, whose domain has extended at least from the banks of the *Ilffus* to the mouths of the *Ganges*: on your left are the beautiful and celebrated provinces of *Iran* or *Persia*, the unmeasured and perhaps unmeasurable deserts of *Arabia*, and the once flourishing kingdom of *Yemen*, with the pleasant isles that the *Arabs* have subdued or colonized; and farther westward, the *Asiatick* dominions of the *Turkish* sultans, whose moon seems approaching rapidly to its wane.—By this great circumference the field of your useful researches will be inclosed; but, since *Egypt* had unquestionably an old connexion with this country, if not with *China*, since the language and literature of the *Abyssinians* bear a manifest affinity to those of *Asia*, since the *Arabian* arms prevailed along the *African* coast of the *Mediterranean*, and even erected a powerful dynasty on the continent of *Europe*, you may not be displeased occasionally to follow the streams of *Asiatick* learning a little beyond its natural boundary; and, if it be necessary or convenient, that a short name or epithet be given to our society, in order to distinguish it in the world, that of *Asiatick* appears both classical and proper, whether we consider the place or the object of the institution, and preferable to *Oriental*, which is in truth a word merely relative, and though commonly used in *Europe*, conveys no very distinct idea.

It now it be asked, what are the intended objects of our inquiries within these spacious limits, we answer, M A N  
and

and N A T U R E; whatever is performed by the one, or produced by the other. Human knowledge has been elegantly analysed according to the three great faculties of the mind. *memory*, *reason*, and *imagination*, which we constantly find employed in arranging and retaining, comparing and distinguishing, combining and diversifying, the ideas, which we receive through our senses, or acquire by reflection; hence the three main branches of learning are *history*, *science*, and *art*: the first comprehends either an account of natural productions, or the genuine records of empires and states; the second embraces the whole circle of pure and mixed mathematicks, together with ethicks and law, as far as they depend on the reasoning faculty; and the third includes all the beauties of imagery, and the charms of invention, displayed in modulated language, or represented by colour, figure, or sound.

Agreably to this analysis, you will investigate whatever is rare in the stupendous fabrick of nature, will correct the geography of *Asia* by new observations and discoveries; will trace the annals, and even traditions, of those nations, who from time to time have peopled or desolated it; and will bring to light their various forms of government, with their institutions civil and religious; you will examine their improvements and methods in arithmetick and geometry, in trigonometry, mensuration, mechanicks, opticks, astronomy, and general physicks; their systems of morality, grammar, rhetorick, and dialectick; their skill in chirurgery  
and

and medicine, and their advancement, whatever it may be, in anatomy and chymistry. To this you will add researches into their agriculture, manufactures, trade; and, whilst you inquire with pleasure into their musick, architecture, painting, and poetry, will not neglect those inferiour arts, by which the comforts and even elegancies of social life are supplied or improved. You may observe, that I have omitted their languages, the diversity and difficulty of which are a sad obstacle to the progress of useful knowledge; but I have ever considered languages as the mere instruments of real learning, and think them improperly confounded with learning itself: the attainment of them is, however, indispensably necessary; and if to the *Persian, Armenian, Turkish, and Arabick*, could be added not only the *Sanscrit*, the treasures of which we may now hope to see unlocked, but even the *Chinese, Tartarian, Japanese*, and the various insular dialects, an immense mine would then be open, in which we might labour with equal delight and advantage.

Having submitted to you these imperfect thoughts on the *limits* and *objects* of our future society, I request your permission to add a few hints on the *conduct* of it in its present immature state.

LUCIAN begins one of his satirical pieces against historians, with declaring that the only true proposition in his work was, that it should contain nothing true; and perhaps it may be advisable

able at first, in order to prevent any difference of sentiment on particular points not immediately before us, to establish but one rule, namely, to have no rules at all. This only I mean, that, in the infancy of any society, there ought to be no confinement, no trouble, no expence, no unnecessary formality. Let us, if you please, for the present, have weekly evening meetings in this hall, for the purpose of hearing original papers read on such subjects, as fall within the circle of our inquiries. Let all curious and learned men be invited to send their tracts to our secretary, for which they ought immediately to receive our thanks; and if, towards the end of each year, we should be supplied with a sufficiency of valuable materials to fill a volume, let us present our *Asiatick miscellany* to the literary world, who have derived so much pleasure and information from the agreeable work of KÆMPFER, than which we can scarce propose a better model, that they will accept, with eagerness any fresh entertainment of the same kind. You will not perhaps be disposed to admit mere translations of considerable length, except of such unpublished essays or treatises as may be transmitted to us by native authors; but, whether you will enrol as members any number of learned natives, you will hereafter decide, with many other questions, as they happen to arise; and you will think, I presume, that all questions should be decided, on a ballot, by a majority of two thirds; and that nine members should be requisite to constitute a board for such decisions. These points, however, and all others, I submit entirely, gentlemen, to your determination, having neither wish nor pre-  
tension

tension to claim any more than my single right of suffrage. One thing only, as essential to your dignity, I recommend with earnestness, on no account to admit a new member, who has not expressed a voluntary desire to become so; and in that case, you will not require, I suppose, any other qualification than a love of knowledge and a zeal for the promotion of it.

Your institution, I am persuaded, will ripen of itself, and your meetings will be amply supplied with interesting and amusing papers, as soon as the object of your inquiries shall be generally known. There are, it may not be delicate to name them, but there are many, from whose important studies I cannot but conceive high expectations; and, as far as mere labour will avail, I sincerely promise, that if, in my allotted sphere of jurisprudence, or in any intellectual excursion, that I may have leisure to make, I should be so fortunate as to collect, by accident, either fruits or flowers, which may seem valuable or pleasing, I shall offer my humble *Nezr* to your society with as much respectful zeal as to the greatest potentate on earth.





**INDIAN ARABIAN and PERSIAN**

**LETTERS**

*Soft and hard Breathings*

	a	e	ha	hha	
<i>Vowels</i>	<i>Diphthongs and Semivowels</i>				
ā	ā	e	è	ya	
i	i	o	ò	wa	
u	ù	ai	au	ra	
ri	rī	lrī	lri	la	
ā	ē	ii	uū	ā	

*Consonants*

c a	c'ha		gha	
k a	kha	ga	gha	na
s a	sha	za	zha	sa
t a	tha	da	{ dha {	na
	}		{ dha }	
ta	{ tha {	da	{ dha {	na
	{ tha }		{ dha }	
pa	{ pha {	ba	{ pha {	ma
	{ fa }		{ va }	

*Compounds*

cha	chha	ja	jha	nya
za	zha	za	cs ha	jnya

# TRANSACTIONS

## OF THE

# ASIATICK SOCIETY.

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### I.

#### A DISSERTATION

*On the ORTHOGRAPHY of ASIATICK WORDS in ROMAN LETTERS.*

BY THE PRESIDENT.

EVERY man, who has occasion to compose tracts on *Asiatick* Literature, or to translate from the *Asiatick* languages, must always find it convenient, and sometimes necessary, to express *Arabian*, *Indian*, and *Persian* words, or sentences, in the characters generally used among *Europeans*: and almost every writer in those circumstances has a method of notation peculiar to himself: but none has yet appeared in the form of a complete system; so that each original sound may be rendered invariably by one appropriated symbol, conformably to the natural order of articulation,

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lation,

lation, and with a due regard to the primitive power of the *Roman* alphabet, which modern *Europe* has in general adopted. A want of attention to this object has occasioned great confusion in history and geography. The ancient *Greeks*, who made a voluntary sacrifice of truth to the delicacy of their ears, appear to have altered by design almost all the oriental names, which they introduced into their elegant, but romantick, histories; and even their more modern geographers, who were too vain, perhaps, of their own language to learn any other, have so strangely disguised the proper appellations of countries, cities, and rivers in *Asia*, that, without the guidance of the sagacious and indefatigable M. D'ANVILLE, it would have been as troublesome to follow ALEXANDER through the *Panjab* on the Ptolemaick map of AGATHODÆMON, as actually to travel over the same country in its present state of rudeness and disorder. They had an unwarrantable habit of moulding foreign names to a *Grecian* form, and giving them a resemblance to some derivative word in their own tongue: thus, they changed the *Cogra* into *Agoranis*, or a river of the assembly, *Uchah* into *Oxydracæ*, or sharp-sighted, and *Renas* into *Aornos*, or a rock inaccessible to birds; whence their poets, who delighted in wonders, embellished their works with new images, distinguishing regions and fortresses by properties, which existed only in imagination. If we have less liveliness of fancy than the Ancients, we have more accuracy, more love of truth, and, perhaps, more solidity of judgement; and, if our works shall afford less delight to those, in respect of whom we shall be Ancients, it may be said without presumption, that we shall give them more correct information on the history and geography of this eastern world; since no man can perfectly describe a country, who is unacquainted with the language of it. The learned and entertaining work of M. D'HÉRELLOT, which professes to interpret and elucidate the names of persons and places, and the titles of books, abounds also in citations from the best writers of

*Arabia*

*Arabia* and *Persia*; yet, though his orthography will be found less defective than that of other writers on similar subjects, without excepting the illustrious Prince KANTEMIR, still it requires more than a moderate knowledge of *Persian*, *Arabick*, and *Turkish*, to comprehend all the passages quoted by him in *European* characters; one instance of which I cannot forbear giving. In the account of *Ibnu Zaidùn*, a celebrated *Andalusian* poet, the first couplet of an elegy in *Arabick* is praised for its elegance, and expressed thus in *Roman* letters:

Ickad hein tenagikom dhamairna;  
Iacdha âlaina alaffa laula taffina.

“The time, adds the translator, will soon come, when you will deliver us from all our cares: the remedy is assured, provided we have a little patience.” When Dr. HUNT of *Oxford*, whom I am bound to name with gratitude and veneration, together with two or three others, attempted at my request to write the same distich in *Arabian* characters, they all wrote it differently, and all, in my present opinion, erroneously. I was then a very young student, and could not easily have procured *Ibnu Zaidùn's* works, which are, no doubt, preserved in the *Bodley* library, but which have not since fallen in my way. This admired couplet, therefore, I have never seen in the original characters, and confess myself at a loss to render them with certainty. Both verses are written by D'HERBELOT without attention to the grammatical points, that is, in a form which no learned *Arab* would give them in recitation; but, although the *French* version be palpably erroneous, it is by no means easy to correct the error. If *âlâsâ*, or a *remedy*, be the true reading, the negative particle must be absurd, since *taâssainâ* signifies *we are patient*, and not *we despair*; but, if *âlâsay*, or *affliction*, be the proper word, some obscurity must arise from the

verb, with which it agrees. On the whole I guess, that the distich should thus be written :

يَكَادُ حِينَ تَنْاجِيكُمْ ضَائِرُنَا  
يَقْضِي عَلَيْنَا الْأَسَى لَوْلَا تَأْسِينَا

*Yecádu hhina tunájicum demáyerunà*

*Yakdì álainà 'lásay lau là taássínà.*

“ When our bosoms impart their secrets to you, anguish would almost fix  
“ our doom, if we were not mutually to console ourselves.”

The principal verbs may have a future sense, and the last word may admit of a different interpretation. Dr. HUNT, I remember, had found in GIGGEIUS the word *dhemáyer*, which he conceived to be in the original. After all, the rhyme seems imperfect, and the measure irregular. Now I ask, whether such perplexities could have arisen, if D'HERBELOT or his Editor had formed a regular system of expressing *Arabick* in *Roman* characters, and had apprized his readers of it in his introductory dissertation ?

If a further proof be required, that such a system will be useful to the learned and essential to the student, let me remark, that a learner of *Persian*, who should read in our best histories the life of Sultan AZIM, and wish to write his name in *Arabick* letters, might express it *thirty-nine* different ways, and be wrong at last : the word should be written *Aázem* with three points on the first consonant.

There are two general modes of exhibiting *Asiatick* words in our own letters : they are founded on principles nearly opposite, but each of them  
has

has its advantages, and each has been recommended by respectable authorities. The first professes to regard chiefly the *pronunciation* of the words intended to be expressed; and this method, as far as it can be pursued, is unquestionably useful: but new sounds are very inadequately presented to a *sense* not formed to receive them; and the reader must in the end be left to pronounce many letters and syllables precariously; besides, that by this mode of orthography all grammatical analogy is destroyed, simple sounds are represented by double characters, vowels of one denomination stand for those of another; and possibly with all our labour we perpetuate a provincial or inelegant pronunciation: all these objections may be made to the usual way of writing *Kummerbund*, in which neither the letters nor the true sound of them are preserved, while *Kemberbend*, or *Cemberbend*, as an ancient *Briton* would write it, clearly exhibits both the original characters and the *Persian* pronunciation of them. To set this point in a strong light, we need only suppose, that the *French* had adopted a system of letters wholly different from ours, and of which we had no types in our printing-houses: let us conceive an *Englishman* acquainted with their language to be pleased with *MALHERBE*'s well-known imitation of *Horace*, and desirous of quoting it in some piece of criticism. He would read thus:

‘ La mort a des rigueurs à nulle autre pareilles;

‘ On a beau la prier :

‘ La cruelle qu’elle est se bouche les oreilles,

‘ Et nous laisse crier.

‘ Le pauvre en sa cabane, ou le chaume le couvre,

‘ Est sujet à ses loix,

‘ Et la garde, qui veille aux barrières du *Louvre*,

‘ N’en défend pas nos rois!’

Would

Would he then express these eight verses, in *Roman* characters, exactly as the *French* themselves in fact express them, or would he decorate his composition with a passage more resembling the dialect of savages, than that of a polished nation? His pronunciation, good or bad, would, perhaps, be thus represented :

- ‘ Law more aw day reegyewrs aw nool otruh parellyuh,
- ‘ Onne aw bo law precay :
- ‘ Law croocellyuh kellay fuh boofshuh lays orellyuh,
- ‘ Ay noo layfuh crecay.
- ‘
- ‘ Luh povre ong faw cawbawn oo luh chomuh luh coovruh,
- ‘ Ay foozyet aw fay lwaw,
- ‘ Ay law gawrduh kee velly ò bawryayruh dyoo *Loovruh*
- ‘ Nong dayfong paw nos rwaw !’

The second system of *Asiatick* Orthography consists in scrupulously rendering letter for letter, without any particular care to preserve the pronunciation ; and, as long as this mode proceeds by unvaried rules, it seems clearly entitled to preference.

For the first method of writing *Persian* words the warmest advocate, among my acquaintance, was the late Major DAVY, a Member of our Society, and a man of parts, whom the world lost prematurely, at a time when he was meditating a literary retirement, and hoping to pass the remainder of his life in domestick happiness, and in the cultivation of his very useful talents. He valued himself particularly on his pronunciation of the *Persian* language, and on his new way of exhibiting it in our characters, which he instructed the learned and amiable Editor of his *Institutes of Ti-*

*mour* at *Oxford* to retain with minute attention throughout his work. Where he had acquired his refined articulation of the *Persian*, I never was informed; but it is evident, that he spells most proper names in a manner, which a native of *Persia*, who could read our letters, would be unable to comprehend. For instance: that the capital of *Azarbáiján* is now called *Tabriz*, I know from the mouth of a person born in that city, as well as from other *Iranians*; and that it was so called sixteen hundred years ago, we all know from the Geography of *Ptolemy*; yet Major DAVY always wrote it *Tutburaze*, and insisted that it should thus be pronounced. Whether the natives of *Semerhand*, or *Samarhand*, who probably speak the dialect of *Soghd* with a *Turanian* pronunciation, call their birth-place, as DAVY spelled it, *Summurkund*, I have yet to learn; but I cannot believe it, and am convinced, that the former mode of writing the word expresses both the letters and the sound of them better than any other combination of characters. His method, therefore, has every defect; since it renders neither the original elements of words, nor the sounds represented by them in *Persia*, where alone we must seek for genuine *Persian*, as for *French* in *France*, and for *Italian* in *Italy*.

The second method has found two able supporters in Mr. HALHED and Mr. WILKINS; to the first of whom the publick is indebted for a perspicuous and ample grammar of the *Bengal* language, and to the second for more advantages in *Indian* literature than *Europe*, or *India*, can ever sufficiently acknowledge.

Mr. HALHED, having justly remarked, ‘ that the two greatest defects in ‘ the orthography of any language are the application of the same letter ‘ to several different sounds, and of different letters to the same sound,’ truly pronounces them both to be ‘ so common in *English*, that he was ‘ exceedingly



‘ exceedingly embarrassed in the choice of letters to express the sound of the *Bengal* vowels, and was at last by no means satisfied with his own selection.’ If any thing dissatisfies me, in his clear and accurate system, it is the use of *double* letters for the long vowels (which might however be justified) and the frequent intermixture of *Italick* and *Roman* letters in the same word; which both in writing and printing must be very inconvenient: perhaps it may be added, that his diphthongs are not expressed analogously to the sounds, of which they are composed.

The system of Mr. WILKINS has been equally well considered, and Mr. HALHED himself has indeed adopted it in his preface to the *Compilation of Hindu Laws*: it principally consists of double letters to signify our third and fifth vowels, and of the common prosodial marks to ascertain their brevity or their length; but those marks are so generally appropriated to books of prosody, that they never fail to convey an idea of metre; nor, if *either* prosodial sign were adopted, would *both* be necessary; since the omission of a long mark would evidently denote the shortness of the unmarked vowel, or conversely. On the whole, I cannot but approve this notation for *Sanscrit* words, yet require something more universally expressive of *Asiatick* letters: as it is perfect, however, in its kind, and will appear in the works of its learned inventor, I shall annex, among the examples, four distichs from the *Bhágawat* expressed both in his method and mine\*: a translation of them will be produced on another occasion; but, in order to render this tract as complete as possible, a fuller specimen of *Sanscrit* will be subjoined with the original printed in the characters of *Bengal*, into which the *Bráhmans* of that province transpose all their books, few of them being able to read the *Dévanágari* letters: so far has their indolence prevailed over their piety!

\* Plate IV.

Let me now proceed, not prescribing rules for others, but explaining those which I have prescribed for myself, to unfold my own system, the convenience of which has been proved by careful observation and long experience.

It would be superfluous to discourse on the organs of speech, which have been a thousand times dissected, and as often described by musicians, or anatomists; and the several powers of which every man may perceive either by the touch or by sight, if he will attentively observe another person pronouncing the different classes of letters, or pronounce them himself distinctly before a mirror: but a short analysis of articulate sounds may be proper to introduce an examination of every separate symbol.

*All things abound with error*, as the old searchers for truth remarked with despondence; but it is really deplorable, that our first step from total ignorance should be into gross inaccuracy, and that we should begin our education in *England* with learning to read *the five vowels*, two of which, as we are taught to pronounce them, are clearly diphthongs. There are, indeed, five simple vocal sounds in our language, as in that of *Rome*; which occur in the words *an innocent bull*, though not precisely in their natural order, for we have retained the true arrangement of the letters, while we capriciously disarrange them in pronunciation; so that our eyes are satisfied, and our ears disappointed. The primary elements of articulation are the *soft* and *hard breathings*, the *spiritus lenis* and *spiritus asper* of the *Latin* grammarians. If the lips be opened ever so little, the breath suffered gently to pass through them, and the feeblest utterance attempted, a sound is formed of so simple a nature, that, when lengthened, it continues nearly the same, except that, by the least acuteness in the voice it becomes a cry, and is probably the first sound uttered by infants; but if, while this

clement is articulated, the breath be forced with an effort through the lips, we form an *aspirate* more or less harsh in proportion to the force exerted. When, in pronouncing the simple vowel, we open our lips wider, we express a sound completely articulated, which most nations have agreed to place the *first* in their symbolical systems: by opening them wider still with the corners of them a little drawn back, we give birth to the *second* of the *Roman* vowels, and by a large aperture, with a farther inflexion of the lips and a higher elevation of the tongue, we utter the *third* of them. By purring up our lips in the least degree, we convert the simple element into another sound of the same nature with the *first* vowel, and easily confounded with it in a broad pronunciation: when this new sound is lengthened, it approaches very nearly to the *fourth* vowel, which we form by a bolder and stronger rotundity of the mouth; a farther contraction of it produces the *fifth* vowel, which in its elongation almost closes the lips, a small passage only being left for the breath. These are all short vowels; and, if an *Italian* were to read the words *an innocent bull*, he would give the sound of each corresponding long vowel, as in the monosyllables of his own language, *sà, sì, sò, se, sù*. Between these ten vowels are numberless gradations, and nice inflexions, which use only can teach; and, by the composition of them all, might be formed an hundred diphthongs, and a thousand triphthongs; many of which are found in *Italian*, and were probably articulated by the *Greeks*; but we have only occasion, in this tract, for two diphthongs, which are compounded of the *first* vowel with the *third*, and with the *fifth*, and should be expressed by their constituent letters: as those vocal compounds which begin with the *third* and *fifth* short vowels, they are generally, and not inconveniently, rendered by distinct characters, which are improperly ranged among the consonants. The tongue, which assists in forming some of the vowels, is the principal instrument in articulating two liquid sounds, which have something of a  
vocal

vocal nature; one, by striking the roots of the upper teeth, while the breath passes gently through the lips; another, by an inflexion upwards with a tremulous motion; and these two liquids coalesce with such ease, that a mixed letter, used in some languages, may be formed by the first of them followed by the second: when the breath is obstructed by the pressure of the tongue, and forced between the teeth on each side of it, a liquid is formed peculiar to the *British* dialect of the *Celtick*.

We may now consider in the same order, beginning with the root of the tongue and ending with the perfect close of the lips, those less musical sounds, which require the aid of a *vowel*, or at least of the *simple breathing*, to be fully articulated; and it may here be premised, that the *harsh breathing* distinctly pronounced after each of these *consonants*, as they are named by grammarians, constitutes its proper *aspirate*.

By the assistance of the tongue and the palate are produced two congenial sounds, differing only as *hard* and *soft*; and these two may be formed still deeper in the throat, so as to imitate, with a long vowel after them, the voice of a raven; but if, while they are uttered, the breath be harshly protruded, two analogous articulations are heard, the second of which seems to characterize the pronunciation of the *Arabs*; while the nasal sound, very common among the *Persians* and *Indians*, may be considered as the *soft palatine* with part of the 'breath passing through the nose; which organ would by itself rather produce a *vocal* sound, common also in *Arabia*, and not unlike the cry of a young antelope and some other quadrupeds.

Next come different classes of *dentals*, and among the first of them should be placed the *sibilants*, which most nations express by an *indented* fi-

gure: each of the *dental* sounds is hard or soft, sharp or obtuse, and, by thrusting the tip of the tongue between the teeth, we form two sounds exceedingly common in *Arabick* and *English*, but changed into hisping sibilants by the *Persians* and *French*, while they on the other hand have a sound unknown to the *Arabs*, and uncommon in our language, though it occurs in some words by the composition of the hard sibilant with our last vowel pronounced as a diphthong. The liquid *nasal* follows these, being formed by the tongue and roots of the teeth, with a little assistance from the other organ; and we must particularly remember, when we attend to the pronunciation of *Indian* dialects, that most sounds of this class are varied in a singular manner by turning the tongue upwards, and almost bending it back towards the palate, so as to exclude them nearly from the order, but not from the analogy, of dentals.

The *labials* form the last series, most of which are pronounced by the appulse of the lips on each other or on the teeth, and one of them by their perfect close: the letters, by which they are denoted, represent in most alphabets the curvature of one lip or of both; and a *natural character* for all articulate sounds might easily be agreed on, if nations would agree on any thing generally beneficial, by delineating the several organs of speech in the act of articulation, and selecting from each a distinct and elegant outline. A perfect language would be that, in which every idea, capable of entering the human mind, might be neatly and emphatically expressed by one specifick word; simple, if the idea were simple; complex, if complex; and on the same principle a perfect system of letters ought to contain one specifick symbol for every sound used in pronouncing the language to which they belonged: in this respect the old *Persian* or *Zend* approaches to perfection; but the *Arabian* alphabet, which all *Mohammedan* nations have inconsiderately adopted, appears to me so complete for the purpose



अ आ इ ई उ ऊ ऋ ॠ

ए ऐ ओ औ अं अः

क का कि की कु कू कृ

कृ कृ के कै को कौ कं कः

ख ग घ ङ च छ ज झ ञ

ट ठ ड ढ ण त थ द ध न

प फ ब भ म य र ल व श

ष स ह ळ ण

purpose of writing *Arabick*, that not a letter could be added or taken away without manifest inconvenience, and the same may indubitably be said of the *Dévanágari* system; which, as it is more naturally arranged than any other, shall here be the standard of my particular observations on *Asiatick* letters. Our *English* alphabet and orthography are disgracefully and almost ridiculously imperfect, and it would be impossible to express either *Indian*, *Persian*, or *Arabian* words in *Roman* characters, as we are absurdly taught to pronounce them; but a mixture of new characters would be inconvenient, and by the help of the diacritical marks used by the *French*, with a few of those adopted in our own treatises on *fluxions*, we may apply our present alphabet so happily to the notation of all *Asiatick* languages, as to equal the *Dévanágari* itself in precision and clearness, and so regularly that any one, who knew the original letters, might rapidly and unerringly transpose into them all the proper names, appellatives, or cited passages, occurring in tracts of *Asiatick* literature.

This is the simplest element of articulation, or first vocal sound, concerning which enough has been said: the word *America* begins and ends with it; and its proper symbol therefore is A; though it may be often very conveniently expressed by E, for reasons, which I shall presently offer. In our own anomalous language we commonly mark this elementary sound by our *fifth* vowel, but sometimes express it by a strange variety both of vowels and diphthongs, as in the phrase, *a mother bird flutters over her young*; an irregularity, which no regard to the derivation of words or to blind custom can in any degree justify. The *Nágari* letter is called *Acâr*, but is pronounced in *Bengal* like our *fourth* short vowel, and in the west of *India*, like our *first*: in all the dialects properly *Indian*



it is considered as *inherent* in every consonant; and is placed last in the system of the *Tibetians*, because the letters, which include it, are first explained in their schools. If our double consonants were invariably connected, as in *Sanscrit*, it would certainly be the better way to omit the simple element, except when it begins a word. This letter answers to the *fat-hbah*, or *open* sound of the *Arabs*, and, in some few words, to the *Zeber* of the *Persians*, or an acute accent placed *above* the letter; but this *Arabian* mark, which was supplied in the *Pahlavi* by a distinct character, is more frequently pronounced at *Isfahan* either like our *first* or our *second* short vowel, as in *chashm* and *ferzend*, and the distinction seems to depend, in general, on the nature of the consonant, which follows it. Two of our letters, therefore, are necessary for the complete notation of the *acâ* and *zeber*; and thus we may be able occasionally to avoid ridiculous or offensive equivocations in writing Oriental words, and to preserve the true pronunciation of the *Persians*, which differs as widely from that of the *Muslimans* in *India*, as the language of our Court at *St. James's* differs from that of the rusticks in the *Gentle Shepherd*.

अ

When the *first* vowel, as the *Persians* pronounce it in the word *bakht*, is doubled or prolonged, as in *bákht*, it has the sound of the second *Nágarí* vowel, and of the first *Arabich* letter, that is, of our long vowel in *cast*; but the *Arabs* deride the *Persians* for their broad pronunciation of this letter, which in *Irán* has always the sound of our vowel in *call*, and is often so prolated, as to resemble the *fourth* and even the *fifth* of our long vowels. Its natural mark would be the short *A* doubled; but an *acute* accent in the middle of words, or a *grave* at the end of them, will be equally clear, and conformable to the practice of polished nations on the





the continent of *Europe*. The very broad found of the *Arabian* letter, which they call *extended*, and which the *Persians* extend yet more, as in the word *ásán*, may aptly enough be represented by the prosodial sign, since it is constantly long; whereas the mark *hamzah* as constantly *shortens* the letter, and gives it the found of the point above or below it; as in the words *ósul* and *Islám*: the changes of this letter may perplex the learner, but his perplexity will soon vanish, as he advances. In writing *Asiatick* names, we frequently confound the broad *á* with its correspondent short vowel, which we improperly express by an *O*; thus we write *Cossim* for *Kásim*, in defiance of analogy and correctness. Our vowel in *found* occurs but seldom, if ever, in *Arabian*, *Indian*, or *Persian* words: it is placed, nevertheless, in the general system with the short prosodial mark, and stands at the head of the vowels, because it is in truth only a variation of the simple breathing.



Our *third* vowel, correctly pronounced, appears next in the *Nágarí* system; for our *second* short vowel has no place in it. This vocal found is represented in *Arabick* by an acute accent under the letter; which at *Mecca* has almost invariably the same pronunciation; but, since, in the *Zend*, a character like the *Greek Epsilon* represents both our *second* and *third* short vowels, the *Persians* often pronounce *zâr* like *zeber*, calling this country *Hend*, and the natives of it *Hendüs*: nevertheless it will be proper to denote the *Sanscrit icâr* and the *Arabian casr* by one unaltered symbol; as in the words *Indra* and *Imám*.



The *third* vowel produced or lengthened is, for the reason before suggested, best marked by an accent either acute or grave, as in *Italian*:

Se cerca, se dice :  
 L'amico dov'è?  
 L'amico infelice,  
 Rispondi, morì !  
 Ah ! no ; sì gran duolo  
 Non darle per me.  
 Rispondi, ma solo :  
 Piangendo partì.

It was once my practice to represent this long vowel by two marks, as in the words *Lebeid* and *Deiwàn*, to denote the *point* in *Arabick* as well as the letter above it ; but my present opinion is, that *Lebid* and *Diwàn* are more conformable to analogy, and to the *Italian* orthography, which, of all *European* systems, approaches nearest to perfection.

### 3

This is our *fifth* vowel ; for our *fourth* short one is, like our *second*, rejected from the pure pronunciation of the *Sanscrit* in the west of *India* and at *Banâras*, though the *Bengalese* retain it in the first *Nâgarî* letter, which they call *ocâr* : to the notation of this sound, our vowel in *full* and the *Persian* in *gul* should be constantly appropriated, since it is a simple articulation, and cannot without impropriety be represented by a double letter. It answers to *hu psilon*, and, like that, is often confounded with *iota* : thus *mushc* has the sound of *misha* among the modern *Persians*, as *Numpha* was pronounced *Nympha* by the *Romans*. The *damm* of the *Arabs* is, however, frequently sounded, especially in *Persia*, like our short *O* in *memory*, and the choice of two marks for a variable sound is not improper in itself, and will sometimes be found very convenient.

The



The same lengthened, and properly expressed by an accent, as in the word *virtù*: it is a very long vowel in *Persian*, so as nearly to treble the quantity of its correspondent short one; and this, indeed, may be observed of all the long vowels in the genuine *Isfahâni* pronunciation; but the letter *vâ* is often redundant, so as not to alter the sound of the short vowel preceding it; as in *khósh* and *khód*: it may, nevertheless, be right to express that letter by an accent.



A vocal sound peculiar to the *Sanscrit* language: it is formed by a gentle vibration of the tongue preceding our *third* vowel pronounced *very short*, and may be well expressed by the prosodial mark, as in *Rîshi*, a Saint. When it is connected with a consonant, as in *Crîshna*, no part of it is used but the curve at the bottom. We have a similar sound in the word *merrily*, the second syllable of which is much shorter than the first syllable of *riches*.



The same complex sound considerably lengthened; and, therefore, distinguishable by the prosodial sign of a *long* vowel.



In *Bengal*, where the *ra* is often sunk in the pronunciation of compound syllables, this letter expresses both syllables of our word *lily*: but its genuine sound, I believe, is *lri*, a short triphthong peculiar to the *Sanscrit* language.



Whatever be the true pronunciation of the former symbol, this is only an elongation of it, and may, therefore, be distinguished by the metrical sign of a long vowel.



Our *second* long vowel, best represented, like the others, by an accent, as in *Vēda*, the sacred book of the *Hindus*, which is a derivative from the *Sanscrit* root *vid*, to *know*. The notation, which I recommend, will have this important advantage, that learned foreigners in *Europe* will in general pronounce the oriental words, expressed by it, with as much correctness and facility as our own nation.



This is a diphthong, composed of our *first* and *third* vowels, and expressible, therefore, by them, as in the word *Vaidya*, derived from *Vēda*, and meaning *a man of the medical cast*: in *Bengal* it is pronounced as the *Greek* diphthong in *poimēn*, a shepherd, was probably founded in  
ancient

ancient *Greece*. The *Arabs* and the *English* articulate this composition exactly alike, though we are pleased to express it by a simple letter, which, on the continent of *Europe*, has its genuine sound. In the mouth of an *Italian* the constituent vowels in the words *mai* and *miei* do not perfectly coalesce, and, at the close of a verse, they are separated; but a *Frenchman* and a *Persian* would pronounce them nearly like the preceding long vowel; as in the word *Mai*, which at *Paris* means our month of the same name, and at *Isfahan* signifies *wine*: the *Persian* word, indeed, might with great propriety be written *mei*, as the diphthong seems rather to be composed of our *second* and *third* short vowels; a composition very common in *Italian* poetry.

## 3

Though a coalition of *acâr* and *ucâr* forms this sound in *Sanscrit*, as in the mystical word *ôm*; yet it is in fact a simple articulation, and the *fourth* of our long vowels.

## 3

Here, indeed, we meet with a proper diphthong, compounded of our *first* and *fifth* vowels; and in *Persia* the constituent sounds are not perfectly united; as in the word *Firdausi*, which an *Italian* would pronounce exactly like a native of *Isfahan*. Perhaps, in *Arabick* words, it may be proper to represent by an accent the letters *yâ* and *wâw*, which, preceded by the *open* vowel, form the respective diphthongs in *Zohair* and *Jâûheri*; but the omission of this accent would occasion little inconvenience.



ly to the same sound, as in *dae* and *cefn*; and a little practice will render such words as *citāb* and *cinnara* familiar to our eyes.

२

We hear much of aspirated letters; but the only proper *aspirates* (those, I mean, in which a strong breathing is distinctly heard after the consonants) are to be found in the languages of *India*; unless the word *cachery*, which our medical writers have borrowed from the *Greek*, be thought an exception to the rule. This aspiration may be distinguished by a *comma*, as the letter before us is expressed in the word *c'hānitra*, a *spade*. The *Arabian*, *Persian*, and *Tuscan* aspirate, which is formed by a harsh protrusion of the breath, while the consonant is roughly articulated near the root of the tongue, may be written as in the word *makhzen*, a *treasury*.

३

Whatever vowel follow this letter, it should constantly be expressed as in the words *gul*, a *flower*, and *gil*, *clay*; and we may observe, as before, that a little use will reconcile us to this deviation from our irregular system. The *Germans*, whose pronunciation appears to be more consistent than our own, would scarce understand the *Latin* name of their own country, if an *Englishman* were to pronounce it as he was taught at school.

४

The proper aspirate of the last letter, as in the word *Rag'huvansa*: the *Persians* and *Arabs* pronounce their *ghain* with a bur in the throat,  
and

and a tremulous motion of the tongue, which gives it a sound resembling that of *r*, as it is pronounced in *Northumberland*; but it is in truth a compound guttural, though frequently expressed by a simple letter, as in *Gaza*, which should be written *Ghazzah*, a city of *Palestine*; and in *gazelle*, as the *French* naturalists call the *ghazâl*, or antelope, of the *Arabians*. The *Persian* word *mîgh*, a cloud, is *még'ha* in *Sanscrit*; as *mîsh*, a sheep, appears also to be derived from *més'ha*, by that change of the long vowels, which generally distinguishes the *Iranian* from the *Indian* pronunciation.

### 3

This is the *nasal* palatine, which I have already proposed to denote by a point above the letter *n*; since the addition of a *g* would create confusion, and often suggest the idea of a different syllable. Thus ends the first series of *Nágari* letters, consisting of the *hard* and *soft* guttural, each attended by its proper aspirate, and followed by a *nasal* of the same class; which elegant arrangement is continued, as far as possible, through the *Sanscrit* system, and seems conformable to the beautiful analogy of nature.

### 5

The next is a series of *compound* letters, as most grammarians consider them, though some hold them to be simple sounds articulated near the palate. The first of them has no distinct sign in our own alphabet, but is expressed, as in the word *China*, by two letters, which are certainly not its component principles: it might, perhaps, be more properly denoted, as it is in the great work of M. D'HERBELOT, by *ts*h; but the inconvenience of retaining our own symbol will be less than that of introducing a new combination, or inventing, after the example of Dr FRANKLIN, a new

character. *China* is a *Sanscrit* word ; and it will be convenient so to write it, though I feel an inclination to express it otherwise.



The same composition with a strong breathing articulated after it. Harsh as it may seem, we cannot, if we continue the former symbol, avoid expressing this sound, as in the word *ch'handas*, metre.



This too seems to have been considered by the *Hindus* as a simple palatine, but appears, in truth, to be the complex expression of *dzh*. Perhaps the same letter may, by a small difference of articulation, partake of two different sounds. This, at least, we may observe, that the letter under consideration is confounded, as a simple sound, with *ya* ; and, as a compound, with *za*, one of its constituents : thus the *yásmín* of *Arabia* is by us called *jasmin* ; while the same man is *Giorgi* at *Rome* and *Zorzi* at *Venice* ; or, (to give an example of both in a single word) *yug*, or *junction*, at *Bánáres*, is *jug* in *Bengal* ; and was pronounced *zug*, or, in the nominative, *zugon*, at *Athens*. We should, however, invariably express the letter before us by *ja*.

The *Arabian* letters *dhāl*, *dād*, and *d'hā*, are all pronounced in *Persia* like *za*, with a sort of lip, from an attempt to give them their genuine sound : they may be well expressed, as in fluxionary characters, by a series of points above them, *ẓ*, *Ẓ*, *Ẕ*.

४

The preceding letter aspirated, as in the word *J'hasha*, a fish.

५

This is the *second* nasal, composed of the former and the letter *ya*. As the *Italian* word *agnello* and our *onion* contain a composition of *n* and *y*, they should regularly be written *anyello* and *onyon*; and the *Indian* sound differs only in the greater nasality of the first letter, which may be distinguished, as before, by a *point*. A very useful *Sanscrit* root, signifying *to know*, begins with the letter *ja*, followed by this compound *nasal*, and should be written *jñya*; whence *jñyāna*, knowledge: but this harsh combination is in *Bengal* softened into *gyā*: it is expressed by a distinct character, which stands last in the plate annexed\*.

६

In the curious work entitled *Toḥṣahū'l Hind*, or *The Present of INDIA*, this is the *fourth* series of *Sanscrit* letters; but, in general, it has the *third* rank, more agreeably, I think, to the analogy of the system. This class is pronounced with an inflexion of the tongue towards the roof of the mouth, which gives an obtuse sound to the consonant, and may be distinguished by an accent above it. The first is the *INDIAN* *īa*, as in the word *cōlāra*, a rotten tree, and is commonly expressed in *Persian* writings by *four* points, but would be better marked by the *ARABIAN* *īā*, which it very nearly resembles.

Plate II.

ठ

The same with a strong breathing after it, as in *Vaicun'ha*, or *unwearied*, an epithet of *Vishnu*.

ड

A remarkable letter, which the *Muslimans* call the *INDIAN dāl*; and expresses, also, by four points over it: but it should, by analogy to the others, be distinguished by an accentual mark, as in the word *danḍa*, punishment. When the tongue is inverted with a slight vibratory motion, this letter has a mixture of the *ra*, with which it is often, but incorrectly, confounded; as in the common word *bera* for *beḍa*, great. It resembles the *ARABIAN ḍād*.

ढ

The preceding letter aspirated, as in *D'hacā*, improperly pronounced *Dacca*. In the same manner may be written the *Arabian ḏhā*, but without the comma, since its aspirate is less distinctly heard than in the *Indian* sound.

ण

This is the *nasal* of the third series, and formed by a similar inversion of the tongue. In *Sanscrit* words it usually follows the letters *ra* and *sha*, (as in *Brāhmeha*, derived from *Brahmah*, the Supreme Being;

Being; *Vishku*, a name of his *preserving power*): or precedes the other letters of the third class.

### उ

Here begins the *fourth* series, on which we have little more to remark. The first letter of this class is the common *ta*, or *hard dental*, if it may not rather be considered as a *lingual*.

### ट

Its aspirate, which ought to be written with a comma, as in the word *Aswatt'ha*, the *Indian* fig-tree, lest it be confounded by our countrymen with the *Arabian* sound in *thurayyâ*, the *Pleiads*, which is precisely the *English* aspiration in *think*; a sound, which the *Persians* and *French* cannot easily articulate: in *Persian* it should be expressed by *s* with a point above it.

### द

The *soft dental* in *Dévatâ*, or *Deity*.

### ध

The same aspirated, as in *D'herma*, justice, virtue, or piety. We must also distinguish this letter by a comma from the *Arabian* in *dhahab*, gold; a sound of difficult articulation in *France* and *Persia*, which we write *thus* very improperly, instead of retaining the genuine *Anglosaxon* letter, or expressing it, as we might with great convenience, *dhus*.

न

The simple *nasal*, founded by the teeth with a little assistance from the nostrils, but not so much as in many *French* and *Persian* words. Both this *nasal* and the former occur in the name *Náráyeha*, or *dwelling in water*.

प

Next come the *labials* in the same order; and first the hard labial *pa*, formed by a strong compression of the lips; which so ill suits the configuration of an *Arabian* mouth, that it cannot be articulated by an *Arab* without much effort.

फ

The proper aspirate of *pa*, as in the word *shepherd*, but often pronounced like our *fa*, as in *fela*, instead of *p'hela*, fruit. In truth, the *fa* is a distinct letter; and our *pha*, which in *English* is redundant, should be appropriated to the notation of this *Indian* labial.

ब

The *soft* labial in *Budd'ha*, wife, and the second letter in most alphabets used by *Europeans*; which begin with a vowel, a labial, a palatine, and a lingual. It ought ever to be distinguished in *Nágari* by a transverse bar, though the copyists often omit this useful distinction.

The

# उ

The *Indian* aspirate of the preceding letter, as in the word *bhāshā*, or a *spoken* dialect. No comma is necessary in this notation, since the sound of *bha* cannot be confounded with any in our own language.

# व

This is the last nasal, as in *Menu*, one of the first created beings according to the *Indians*: it is formed by closing the lips entirely, whilst the breath passes gently through the nose. And here ends the regular arrangement of the *Nāgarī* letters. Another series might have been added, namely, *sa*, *sha*, *za*, *zha*, which are in the same proportion as *ta*, *tha*, *da*, *dha*, and the rest; but the two last sounds are not used in *Sanscrit*.

# य

Then follows a set of letters approaching to the nature of vowels: the first of them seems in truth to be no more than our *third* short vowel, beginning a diphthong, and may, therefore, be thought a superfluous character. Since this union, however, produces a kind of consonant articulated near the palate, it is ranked by many among the consonants, and often confounded with *ja*: hence *Yamunā*, a sacred river in *India*, called also the *Daughter of the Sun*, is written *Jomanes* by the *Greeks*, and *Junnā*, less properly, by the *English*.

The



# व

The two liquids *va* and *ma*, one of which is a lingual and the other a labial, are kept apart, in order to preserve the analogy of the system; and the other two are introduced between the two femivowels: the first of these is *ra*, as in *RA'MA*, the conqueror of *Silân*.

# ल

The second is *la*, in *Lanca*, another name of that island both in *Tibet*, and in *India*. A defect in the organs of the common *Bengalese* often causes a confusion between these two liquids, and even the sound of *na* is frequently substituted for the letter before us.

# वा

When this character corresponds, as it sometimes does in *Sanscrit*, with our *va*, it is, in fact, our *fifth short* vowel preceding another in forming a diphthong, and might easily be spared in our system of letters; but, when it has the sound of *va*, it is a labial, formed by striking the lower lip against the upper teeth, and might thus be arranged in a series of proportionals, *pa, fa, ba, va*. It cannot easily be pronounced in this manner by the inhabitants of *Bengal*, and some other provinces, who confound it with *ba*, from which it ought carefully to be distinguished; since we cannot conceive, that, in so perfect a system as the *Sanscrit*, there could ever have been two symbols for the same sound. In fact, the *Montes Parvati* of our ancient geographers were so named from *Parveta*, not *Parteta*, a mountain. The *wâu* of the *Arabs* is always a vowel, either separate or coalescing with

with another in the form of a diphthong; but in *Persian* words it is a consonant, and pronounced like our *va*, though with rather less force.

### श

Then follow three *sibilants*, the first of which is often, very inaccurately confounded with the second, and even with the third; it belongs to that class of consonants which, in the notation here proposed, are expressed by acute accents above them, to denote an inversion of the tongue towards the palate, whence this letter is called in *India* the *palatine sa*. It occurs in a great number of words, and should be written as in *paláśa*, the name of a sacred tree with a very brilliant flower. In the same manner may be noted the *śād* of the *Arabs* and *Hebrews*, which last it resembles in shape, and probably resembled in sound; except that in *Cásmír*, and the provinces bordering on *Persia*, it is hardly distinguishable from the following letter.

### ष

The *second* is improperly written *sha* in our *English* system, and *cha*, still more erroneously, in that of the *French*; but the form generally known may be retained, to avoid the inconvenience of too great a change even from wrong to right. This letter, of which *sa* and *ha* are not the component parts, is formed so far back in the head, that the *Indians* call it a *cerebral*: either it was not articulated by the *Greeks*, or they chose to express it by their *Xi*; since of the *Persian* word *Ardashir* they have formed *Artaxerxes*.

### स

The dental *sa*, which resembles the *Hebrew* letter of the same sound, and, like that, is often mistaken by ignorant copyists for the *ma*.

The

## इ

The strong breathing *ha*, but rather misplaced in the *Nāgarī* system; since it is the second element of articulate sounds. The very hard breathing of the *Arabs* may be well expressed by doubling the mark of aspiration, as in *Muhammed*, or by an accent above it, in the manner of the long vowels, as in *Aḥmed*.

## झ

The *Indian* system of letters closes with a compound of *ca* and *sha*, as in the word *paricshā*, ordinal: it is analogous to our *x*, a superfluous character, of no use, that I know of, except in algebra. The *Bengalese* give it the sound of *cya*, or of our *k* in such words as *kind* and *sky*; but we may conclude, that the other pronunciation is very ancient, since the old *Persians* appear to have borrowed their word *Racshah* from the *Racsha*, or demon of the *Hindus*, which is written with the letter before us. The *Greeks* rendered this letter by their *Khi*, changing *Dacshin*, or the south, into *Dahhin*.

All the sounds used in *Sanscrit*, *Arabick*, *Persian*, and *Hindi*, are arranged systematically in the table prefixed to this dissertation\*; and the singular letter of the *Arabs*, which they call *āin*, is placed immediately before the consonants. It might have been classed, as the modern *Jews* pronounce it, among the strong *nasals* of the *Indians*; but, in *Arabia* and *Persia*, it has a very different sound, of which no verbal description can give an idea, and may not improperly be called a *nasal vowel*: it is uniformly distinguished by a *circumflex* either above a short vowel, or over the letter preceding a long one, as *ilm*, learning; *āālim*, learned.

\* Plate I.



अहमेवाहमेवाग्रे नान्यथा सदसत् परम्  
पश्चादहं ब्रूतेत्येवोपशिष्येत सोऽस्म्यहम्

श्रुतेर्यथप्रतीयेत न प्रतीयेत चाल्लनि  
तदिष्टादात्मने मायां यथा भासो यथात्मः

यथा मदाति भूतानि भूतेषूच्चावचेषु  
प्रविष्टान्यप्रविष्टानितच्छतेषु न तेषु हं

एतावदेव जिज्ञास्य तत्त्वजिज्ञासुनात्मनः  
अन्यव्यतिरेकाभ्यं यत् स्यात् सबन्त सर्वदा

Agreeably to the preceding analysis of letters, if I were to adopt a new mode of *English* orthography, I should write ADDISON's description of the angel in the following manner, distinguishing the *simple breathing*, or first element, which we cannot invariably omit, by a perpendicular line above our first or second vowel :

Sò hwén sm é<sup>~</sup>njel, bai divain cāmánd,  
 With raifín tempests shécs a gílti land,  
 Sch az äv lét ór pél Britanya pást,  
 Cálm and firín hī drāivz dhi fyúryas bláft,  
 And, plíz'd dh'ālmaitiz ārdérz tu perfórm,  
 Raids in dhi hwerlwind and dairectis dhi flārm.

This mode of writing poetry would be the touchstone of bad rhymes, which the eye as well as the ear would instantly detect; as in the first couplet of this description, and even in the last, according to the common pronunciation of the word *perform*. I close this paper with specimens of oriental writing, not as fixed standards of orthography, which no individual has a right to settle, but as examples of the method, which I recommend; and, in order to relieve the dryness of the subject, I annex translations of all but the first specimen, which I reserve for another occasion.

## I.

*Four Distichs from the SRI'BHA'GAWAT\*.*

## Mr. WILKINS's Orthography.

āhāmēvāsāmēvāgrē nānyādyāt śādāsāt pārām  
 pāschādahām yādētāchchā yōvāsēshyētā sōsmyāhām

\* See Plate IV. The Letters are in Plate II.

rēetēṛtham yāt prātēcyētā nā prātēcyētā chātmanēc  
tādvēdyād ātmanō māyām yāthā bhāsō yāthā tāmāh

yāthā māhāntē bhōtāntē bhōtēshōchchāvāchēshwānō  
prāvēśhtānyāprāvēśhtāntē tāthā tēshō nātēshwāhām

ētāvādēvā jējñāsyaṁ tāttwā jējñāsōnātmanāh  
ānwāyā vyātēṛcābhyām yāt fyāt sārvaṭrā sarvādā.

This wonderful passage I should express in the following manner :

ahamēvāsamēvāgrē nānyadyat sadasat param  
paśchādaham yadētachcha yōvaśishyēta sōsmyaham

rītērt'ham yat pratīyēta na pratīyēta chātmani  
tadvidyādātmanō māyām yat'hābhāsō yat'hā tamah

yat'hā mahānti bhūtāni bhūtēshūchchāvachēshwanu  
pravishfānyapravishfāni tat'hā tēshu na tēshwaham

ētāvādēva jījñāsyaṁ tattwa jījñāsūnātmanah  
anwaya vyatirēcābhyām yat syāt sarvatra servadā.

## II.

### MO'HA MUDGARA.

The title of this fine piece properly signifies, *The Mallet of Delusion* or *Folly*, but may be translated, *A Remedy for Distraction of Mind*: it is com-  
posed

posed in regular anapæstic verses according to the strictest rules of *Greek* prosody, but in rhymed couplets, two of which here form a *Stóca*.

মুচুজীহিংগবত্ৰা° দহতুযুষ্টিবনঃ নৃবিভূতা° ।  
বলভদোনিজকমৌপাত° বিত্ত° তেনবিনোদয়চ্চিত্ত° ॥

বাতবদ্যাক্ষত্বেপ্তঃ স° সাবোয়মতীবিচিত্রঃ ।  
দস্যত্ব° বান্ধতামায়াউস্তত্ব° চিত্তবতদিদ° ভ্রাতঃ ॥

মানবর্ষণজনযৌবনগর্ভ° হস্ততিনিমেঘাংকানঃ সর্ব° ।  
মানানমমিদমখিল° হিহুদ্রম্পদ° পুৰিশাশুবিদিত্তা ॥

নলিনীদলগুজলবত্তবন° উজ্জীবনমতিশয়চপল° ।  
ক্ৰমিহসঙ্কস° গতিবৈবতবতিভবাব্ধবতরণৌকা ॥

বাবঙ্কন° ভাবম্ভবা° ভাবঙ্কনীউচ্চদেশন° ।  
ইতিস° সাব্বেস্ফুটউদোষঃ কথমিহমানবতবসপ্রাঘঃ ॥

দিনযামিন্যোদাম° পুাতঃ শিশিববসন্তোপনবামাতঃ ।  
কানঃ ক্রীড়তিগজুত্ৰাযুদুদপিনমুক্ষত্ৰাশাবায়ুঃ ॥

অগ° গণিত° পণিত° হুত° দত্তবিহীন° জাত° তত্ত° ।  
কবধুতকল্পিতশোভিতদ্য° উদপিনমুক্ষত্ৰাশাত্ত° ॥



সূৰবৰযাদ্ৰিৰতকতলবাসঃ শয্যাভূতলমজিন° বাসঃ ।  
সৰ্বৰ্পবিগ্ৰহভোগত্যাগঃ কস্যসৃথ° নৰবোত্তিবিবাগঃ ॥

শত্ৰৌমিত্ৰেপুত্ৰেবনৌমানবগম্ব° বিগ্ৰহসম্বো ।  
ভবসমচিহ্নঃ সৰ্বব্ৰহ্ম° বাঙ্কশ্যচিৰাঙ্গদিবিষ্ণু° ॥

অঙ্ককুণাচলসপ্তসমুদ্রাবৃক্ষপুৰন্দৰদিনকববদ্রাঃ ।  
নত্ৰ° নাহ° নাম° নোকমুদপিৰ্হিমর্থ° ত্ৰিমুভেশোকঃ ॥

ভ্রমিমমিচাণ্যগ্ৰৈকৌবিস্কৰ্য্য° নপ্যনিমম্যসহিষ্ণুঃ ।  
সৰ্ব° পশ্যন্ন্যায়ান° সৰ্বব্ৰোৎসৃজভেদজ্ঞান° ॥

বানস্তাবৎত্ৰীড়াশক্তসুৰ্য্যাস্তাবৎতকনীৰক্তঃ ।  
বৃহস্পতিবৎচিহ্নাবগ্নঃ পৰমেব্ৰহ্মণিকোপিনলগ্নঃ ॥

দ্বাদশপঙ্কটিকাভিৰশেষঃ শিষ্যাণা° কথিতোভূতপদেশঃ ।  
যেষা° নৈষববোত্তিবিদেহ° তেষা° কঃ কুব্জতামত্তিবেক° ॥

múḁha jahíhi dhanágamatrishháam  
curu tenubuddhímanah suvitrishnáam  
yallabhasè nijacarmópáttam  
vittam téna vinódaya chittam.

cá tava cántà castè putrah  
sañscároyam atívavichittrah  
casya twam và cutà áyáta  
stattwam chintaya tadidam bhrátah.

má curu dhanajanayauvanagarvam  
 haratí niméshát calah sarvam  
 máyámayamidamac'hilam hitwà  
 brhmapadam previśásu viditwà.

nalínídalagatajalavattaralam  
 tadvajjivanamatisaya chapalam  
 cshcnamiha sajjana saṅgatiṛecà  
 bhawati bhawánavataranè naucà.

angam galitam palitam muṇḍam  
 dantavihiṇam játam tundam  
 caradhṛitacampitaśóbbhitadandam  
 tadapi namuñchatyása bhánḍam.

yáv ajjananam távanmaráham  
 távajjananì jatharè 'sayanam  
 iti sansárè sp'hufatara dóshah  
 cat'hamiha mánava tava sañtóshah.

dinayáminyau sáyam prátah  
 śiśiravasantau punaráyatah  
 cālah crīdati gach'hatyāyu  
 stadapi na muñchatyásāvāyuh.

suravaramaṇdiratarutalavāsah  
 śayyà bhútalamajinam vásah  
 servaparigrahabhógatyāgah  
 casya suc'ham na caróti virāgah.

śatrau mitrè putrè bandhau  
 má curu yatnam vighrahasāndhau  
 bhava samachittah sevatra twam  
 vānch'hasyachirād yadi vishnutwam.

ashṭaculāchalaseptasamūdrā  
 brhmapurandaradinacararudrāh  
 natwam nāham nāyam lōca  
 stadapi cimart'ham criyatè śócāh.

twayi mayi chānyatraicò vishnur  
 vyart'ham cupyasi mayyasabishnuh  
 servam paśyātmanyātmānam  
 servatrōtsrija bhédajnyānam

vālastāvāt crīdāśāñla  
 staruñastāvāt tarūñirañlah  
 vriddhastāvach chuntāmagnah  
 peremē brahmañi cōpi nalagnah.

dwādaśa pajj'hañicābhiraśēshah  
 śishyānam cat'hītōbhyupadēśah  
 yēshām naisha carōti vivēcam  
 tēshām cah curutāmatirēcam.

#### A verbal Translation.

1. Refrain, deluded *mortal*, thy thirst of acquiring wealth; excite an aversion *from it* in *thy* body, understanding, and inclination: with the riches

riches which thou acquirest by thy own actions, with these gratify thy soul.

2. Who *is* thy wife; who thy son; how extremely wonderful is even this world; whose *creature* thou also *art*; whence thou camest—meditate on this, O brother, *and again* on this.

3. Make no boast of opulence, attendants, youth; all *these* time *hatches* away in the twinkling of an eye: checking all this illusion like *Maya*, fix thy heart on the foot of BRAHME, speedily gaining knowledge of Him.

4. As a drop of water moves tremulous on the lotus-leaf, thus *a* human life inexpressibly slippery: the company of the virtuous *endures* here but for a moment; that is our ship in passing the ocean of the world.

5. The body *is* tottering; the head, grey; the mouth, toothless: the delicate staff trembles in the hand which holds it; still the flaggon of covetousness remains unemptied.

6. How soon *are we* born! how soon dead! how long lying in the mother's womb! how great is the prevalence of vice in this world! Wherefore, O man, hast thou complacency here below?

7. Day and night, evening and morning, winter and spring, depart and return: time sports, life passes on; yet the wind of expectation continues unrefrained.

8. To dwell under the mansion of the high Gods at the foot of a tree, to have the ground for a couch, and a hide for vesture; to renounce all extrinsic enjoyments; whom doth not such devotion fill with delight?

9. Place not thy affections too strongly on foe or friend, on a son or a kinsman, in war or in peace: be thou even-minded towards all, if thou desirest speedily to attain the nature of VISHNU.

10. Eight original mountains, and seven seas, BRAHME, INDRA, the Sun, and RUDRA, *these are permanent*: not thou, not I, not this or that people, wherefore then should anxiety be raised in our minds?

11. In thee, in me, in every other being is VISHNU; foolishly art thou offended with me, not bearing my approach: see every soul in thy own soul; in all places lay aside a notion of diversity.

12. The boy so long delights in his play; the youth so long pursues his damsel; the old man so long broods over uneasiness; that no one meditates on the Supreme Being.

13. This is the instruction of learners delivered in twelve distinct stanzas; what more can be done with such, as this work fills not with devotion?

### III.

The following Elegy, which is chosen as a specimen of *Arabick\**, was composed by a learned Philosopher and Scholar, M<sup>r</sup> MUHAMMED HUSAIN, before his journey to *Haidarâbâd* with RICHARD JOHNSON, Esq.

*mâ ânsa lâ ânsa âllatî*  
*jaat ilayya âlâi hadhar*  
*âlnaûmu âthkala jafnahâ*  
*waâlkalbu lâra bihi aldhaâr*

\* Plate V. and Plate III.

*raîadat*

هَذَا الْأَجَلُ بِحَسْبِ

مَا أَسْرَعَ بِنَا أَسْرَاقِي  
 الْوَدَّ أَنْ تَقْتُلَ كُلَّ جَهْمَا  
 رَعِدَتِ أَسَادُ وَفِيهَا  
 تَرَبَّتْ جُلُودُ جَلَلَا  
 نَشَلَهُ الطُّغْيَانُ لَطَائِفَ  
 فِي نَفْسِهِ مَدْرُوحَاتِ  
 وَتَرَبَّتْ أَلْسِنُهُ كَأَمْجَلِ  
 يَكِي عُمُورٍ لِلنَّجَا  
 وَالْقُرُونُ يَسْمُرُ قُرُونُ  
 الرَّجُلُ كَمَا كَمِي سُرُونُ  
 فَعُورَتِ نَهَايَتُهُ وَهَدَا  
 وَاللَّحْمُ كُلُّ حَكْدٍ وَهَدَا  
 وَتَشْتَتِ إِذْ كَلِمَتِ  
 خَلَّتْ شَبَابِي عَلَى  
 قَالَتْ أَدْبُكُ فَادْبُكَا  
 بَعْضًا وَأَمْرٌ لِلْمَوْتِ  
 وَنَنْ وَهَنْ أَمْرٍ لِي  
 أَوْ كَمَا تَبْتَزُّ لَهَا لِمَا  
 بَادَا أَمَارِي خَوْلِ  
 أَلْفَتْ أَلْفَةَ أَلْفِ  
 أَوْ قَدْ بَلَغْتُ حَوَارِثَا  
 مَا نَحَرَ عَلَى قَبُولِ الذَّنْبِ

كَأَوْتِ الْبُكْلَ حَذَرَهُ  
 وَأَقْلَبْتُ كَأَرِيهِ الْعَسْرَ  
 فَمَجَلَّتْ مِنْهَا الْعَسْرُ  
 أَلْفًا حَارِيَةً  
 قَدَدَتْ مَا كُنْتُ لَعْنَةً  
 كَوَادِرُ حَسْرِ الْعَسْرِ  
 وَكُنْ الْخِزْمُ كُلُّ أَشْكَرِ  
 عَلَى طَلْعِ أَمْسِ الْقُرُونِ  
 مَحْمُودًا إِلَى الْعَسْرِ  
 أَلْفًا عَلَى مَوَاحِدِ  
 طَرِبَتْ عَيْنَانِ مِنْ  
 وَكُنْ دِيَارًا لَطِيفَةً  
 وَتَرَبَّتْ خَادِي النُّكْرِ  
 أَنْتَ لِي مَهْمَا الْعَسْرِ  
 كَرَامَتِي مَقْفَرِ  
 وَكُنْ مَا صَحَابُ الْعَسْرِ  
 أَوْ رَدَا نَزْوَ الْفَكْرِ  
 وَنَارُ مَوْجِ سَعِيرِ  
 حَوْلًا يَلْدِي رِيَاخِ  
 وَنَسَبَ أَوْ أَمْرَ النُّكْرِ  
 مَا يَجْعَلُ كُلَّ مَعْدٍ  
 وَأَمْرًا لَنَا وَنَا مَعْدٍ



raiqadat ásuuda kaúmhá  
 futakhallasat muphá álgharar  
 nazuáí khalákhílah lehá  
 állá tufayihá bishar

teshu állaríha liahulmahín  
 fakadat bihá nazma álsahhar  
 fi laílalah kad cahhalat  
 lisawádhá jafua alkamar

wa terai álghamána enápmulín  
 terai áluqúma alai áshar  
 tebei úyúnah lilemai  
 álai kadáyikihá álsahhar

waálberkr yetsimu thegríku  
 áyatán lhátíca álghiyar  
 waálrádu áda yukharíku  
 álásmákha fi sunmi álhojar

fahawat tuáánikuní wakat  
 kadharat ináki min khafar  
 waáldemú bella khudúdahá  
 wasakáí riyadáh lilnaáhar

wateneffasat idh callamat  
 waramat fuwádi biálshehar  
 áhallat tuáátituncéí álai  
 án jedda lí ázmu álsafar



*kalat ádhabta fuwádaná  
waádhaktahu herra álsakar  
taási áwámera lilhawai  
watufúú násihaca álghudar*

*watedúru min árđin ilai  
árđih wamá terđai álmekarr  
yaúmán tesíru bica álbihháru  
watárahah turmai kibarr*

*má dhá áfádaca jaúláhoh  
háula álbiládi siwai áldajar  
aálifta áđhtáa álfelá  
wanesíta áráma álbasher*

*ám had melelta jiwáraná  
yá wáihá khillin had nafar  
fárhem álai kalbí átladhí  
ráma álsuluwra wamá kadar.*

#### The Translation.

1. Never, oh! never shall I forget the fair one who came to my tent  
with timid circumspéction:

2. Sleep fat heavy on her eye-lids, and her heart fluttered with fear.

3. She had marked the dragons of her tribe, (the *sentinels*,) and had  
dismissed all dread of danger from them:

4. She

4. She had laid aside the rings, which used to grace her ankles; left the found of them should expose her to calamity :

5. She deplored the darkness of the way, which hid from her the morning-star.

6. It was a night, when the eye-lashes of the moon were tinged with the black powder (*Alcohol*) of the gloom ;

7. *A night*, in which thou mightest have seen the clouds, like camels, cagerly grazing on the stars ;

8. While the eyes of heaven wept on the bright borders of the sky ;

9. The lightning displayed his shining teeth, with wonder at this change *in the firmament* ;

10. And the thunder almost burst the ears of the deafened rocks.

11. She was desirous of embracing me, but, through modesty, declined my embrace.

12. Tears bedewed her cheeks, and, to my eyes, watered a bower of roses.

13. When she spake, her panting sighs blew flames into my heart.

14. She continued expostulating with me on my excessive desire of travel.

15. 'Thou hast melted my heart, she said, and made it feel inexpressible anguish.

16. 'Thou art perverse in thy conduct to her who loves thee, and obsequious to thy guileful adviser.

17. 'Thou goest round from country to country, and art never pleased with a fixed residence.

18. 'One while the seas roll with thee; and, another while, thou art agitated on the shore.

19. 'What fruit, but painful fatigue, can arise from rambling over foreign regions?

20. 'Hast thou associated thyself with the wild antelopes of the desert, and forgotten the tame deer?

21. 'Art thou weary then of our neighbourhood? O woe to him who flees from his beloved!

22. 'Have pity at length on my afflicted heart, which seeks relief, and cannot obtain it.'

Each couplet of the original consists of two *Dimeter Iambicks*, and must be read in the proper cadence.

As





## IV.

As a specimen of the old Persian language and character, I subjoin a very curious passage from the *Zend*, which was communicated to me by BAHMAN, the son of BAHRA'M, a native of Yezd, and, as his name indicates, a *Parsi*: he wrote the passage from memory; since his books in *Pahlavi* and *Deri* are not yet brought to *Bengal*. It is a supposed answer of I'ZAD or GOD to ZERAHTUSHT, who had asked by what means mankind could attain happiness.

*Az pid u mād che ē pid u mād nē khoshīd bīd hargiz bihist nē vīnīd. be jāji erfah bīzah vīnīd; mehān, rā, be āzarmān, dārd, sehān rā be kich gūnah mayāzānīd: aj khīshāvendi dervīsh nang medārīd; dād u vendād i khālīl; yectā beh cār dārīd; dz vīshī zī ten pabī cūdī shēr nemāyīd; ma-kudā ē ashū ten khī sū rā dūzakhī vīd. Apānche bē bē shēr, nashāhad be casān mupāsēndīd va mā cūnīd: herche be gītī cūnīd be mainū az āuch pāzī-rah ayed\*.*

## A Verbal Translation.

"If you do that with which your father and mother are not pleased, you shall never see heaven; instead of good spirits, you shall see evil beings: behave with honesty and with respect to the great, and on no account injure the mean: hold not your poor relations a reproach to you: imitate the justice and goodness of the Only Creator: meditate on the resurrection of the future body; lest you make your souls and bodies the inhabitants of hell; and whatever would be displeasing to yourselves, think not that

\* Plate VII. The *Zend* Letters are in Plate III.

pleasing to others, and do it not: whatever good you do on earth, for that you shall receive a retribution in heaven."

It will, perhaps, be suspected, (and the language itself may confirm the suspicion) that this doctrine has been taken from a religion very different both in age and authority, from that of ZERA'HTUSHT.

## V.

The following story in modern *Persian* was given to me by *Mirzā ABDU'LRAHH'IM* of *Isfahān*; it seems extracted from one of the many poems on the loves of *MEJNU'N* and *LAILI'*, the *ROMEO* and *JULIET* of the East. Each verse consists of a *Cretick* foot followed by two *Choriambi*, or a *Choriambus* and a *Molossus*.

شیرمست سرپستان الم	پروورش یافته' دامن غم
آبرنگ ورخ لیلیای جنون	خال رخساره' بامون مجنون
یافت چون راه بکامانه' عشق	آستان سدید رخاته' عشق
بر سرش شخص جنون سایه نکند	قصه' ناشقیش کشت بلند
در عرب هر طرفی خونناشد	نقل او نقل مجالس باشد
بد ابروی بحرب والا شان	صاحب کمند و ثروت بجهان
تر کشد غم هجران دیده	پر کل داغ محبت چیده
دیده در طفلی خود سوز فراق	تلخی زهر فراقش بمذاق

یافت چون قصه آن در رسکال      کرد فرمان بخلانی در حال  
 که سویی نبرد قدم ساز ز سر      شوی به تعجیل روان چون صرصر  
 آنکه دلبرده ز مجنون بنگاه      به برم زدد بسیار همراه  
 رفت و آورد غلامک در حال      لیلی آن بادشاه ملک جمال  
 بغلامی دگرش شد فرمان      که تو هم شوی بسوی دشت روان  
 جانب زینت ارباب جنون      شمع پر نور محبت مجنون  
 زدد آورم آن سوخته را      آن بکار سو  
 رفت و بر کشت غلامک چونگاه      والی کشور عشقش برده  
 کرد او را چون نظر مرد امیر      دید زاری بغم عشق اسیر  
 بر سرش مستخص جدول کرده وطن      زخم هجران به تنش پیراهن  
 موی سر بر بدنش کشته قبا      موزه از آینه پابر پا  
 مثانه از خار مغیلان بر موش      خرده از یک بیابان بر دوش  
 گفت کاهی کم شده دادی نعم      هیچ خواهی که تمنیات دهم  
 سر فراز گفتم از مکننت و بجاه      لیلی آرم به زت خاطر خواه



گفتني ني که بعد است بعيد      ذره را ام نظري باخورشيد  
 گفت خواهي که کنسي راست بگو      سير آن صغيم رخسار نکو  
 يانداري بجايش ميلي      راست برکوي بجان ليلي  
 گفت کاي قدوه بار باب کرم      ذره مخاکد رت تاج سرم  
 بردام درد زليلي کافي است      خواهش وصل ز بي انصافيت  
 بهر خور سندي اين جزو حقير      بس بود بر توي از مهر مير  
 گفت و کرد سوي دشت روان      ديد که گريان و مره اشک نشان

*Shirmasti seri pistāni ālem  
 perveresh yāfsteḥi dāmeni ghem*

*ābi rang ò rokhi lailāyi jonūn  
 khāli rokhsārehi hāmān Mejnūn*

*yāft chūn rāh bi cāshānehi ishk  
 āstān shud bideri khanehi ishk*

*ker seresh shakhsī jonūn sāyah ficand  
 kūsḥi āshikī āsh gasht boland*

*der ārab her farāfī ghaughā shud  
 nakli ù nokli mejālis-hā shud*

búd amírì biârab râlá shâh  
 shâhibi micnat ô servat\* bijehân

torc tâzi ghemi hējān didah  
 pur guft dāghi moħabbat chidah.

didah der tahiyyi khôd sūzi ferâh  
 talhiyyi zahri ferâkesh bimezâh

yâft chun kissehî ân derd sigâl  
 card fermân bighulâmî der hâl

ceh sūyî najd kadam sâz zi  
 shau beh tâjil ravân chûn šeršer

ân ceh dil bordah zi Mejnûn bi nigâh  
 beh terem zûd biyâver hemrah

raft ô âvurd ghulâmac der hâl  
 Laillî ân pādishahi mulci jemâl

keh ghulâmî digareh shud fermân  
 ceh tò hem shau bi sūyî-dasht ravân

jânibi zinati ârtâbi jonûn  
 shemî pur nûri moħabbat Mejnûn

The reader will supply the point over s, when it stands for *sh*.

zād āver berem<sup>7</sup> ān sūkh<sup>7</sup>tah rā  
 ān jigarsūzi ghem āndūkh<sup>7</sup>tah rā

raft ō bergasht ghulāmac chū nigāh<sup>\*</sup>  
 vāliyi cishvari ishkesh hemrāh

card ūā chū nāzar mardī āmīr  
 dīd zārī bi ghemi ishk āsir

ber seresh shahhī jonūn cardah va<sup>7</sup>ten  
 zahhmi hejrān bi tenesh pīrāhen

mūyi ser ber bedenesht gash<sup>7</sup>tah kobā  
 mūzah āz ālilahi pā ber pā

shānah āz khari<sup>\*</sup> mughlān ber mūsi  
 khirkah āz rīgi biyābān ber dūsh

goft cāi gomshudahi vādiyi ghem  
 hīch khwāhī ceh temennāt dehēm<sup>\*</sup>

serferāzat cūyam āz micnat ō jāh  
 Laīlī ārem biberet khāfer khwāh

goft nī nī ceh baīdest baīd  
 zerreh rā hem nazari bā khorshīd

gh<sup>7</sup> khwāhī ceh conī rāst bigū  
 \* sairi ān šaffāhi rokhsāri nicū

*yâ nedârî bijemâlesh maîlî*  
*râst bergûyi bi jâni Lailî*

*goft câi kodvahi ârbâbi cerem*  
*zerrahi khâci deret tâjî cerem*

*ber dilem derd zi Lailî câfist*  
*khwâheshi vaîl zi bî insâfist*

*goft ô gardâd sūyi dasht ravân*  
*dîdah giryân ô mizhah âshcîshân*

#### The Translation.

1. *The man who had inebriated himself with milk from the nipple of Anguish, who had been nourished in the lap of Affliction,*

2. MEJNU'N, mad with the bright hue and fair face of LAÏLÎ, himself a dark mole on the cheek of the desert,

3. Having found the way to the mansion of love, became fixed like the threshold on the door of love's palace.

4. Over his head the form of Madness had cast her shadow: the tale of his passion was loudly celebrated.

5. Among

5. Among the *Arabs* a tumult arose on all sides : the relation of his adventures was a deffert in their affemblyes.

6. A powerful Prince reigned in *Arabia*, poffeffing worldly magnificence and riches :

7. He had feen the depredations of Grief through abfence from a beloved object : he had plucked many a black-spotted flower from *the garden of love*.

8. Even in his infancy he had felt the pain of feparation : the bitter tafte of that poifon remained on his palate.

9. When he learned the ftory of that afflicted lover, he infantly gave an order to a flave,

10. *Saying*, ‘ Make thy head like thy feet in running towards *Najd* ; go  
‘ with celerity, like a violent wind :

11. ‘ Bring fpeedily with thee to my prefence Her, who has ftolen the  
‘ heart of MEJNU’N with a glance.’

12. The ftripling ran, and in a fhort time brought LALIL’, that Empreſs in the dominion of beauty.

13. To another flave the Prince gave this order : ‘ Run thou alfo into the  
‘ defert,

14. ‘ Go to that ornament of frantick lovers, MEJNU’N, the illumined ta-  
‘ per of love.

15. 'Bring quickly before me ~~that~~ inflamed *youth*, that heart-consumed anguish-pierced lover.

16. The boy went, and returned, in the twinkling of an eye, accompanied by the ruler in the territories of love.

17. When the Prince looked at him, he beheld a wretch in bondage to the misery of desire.

18. Madness had fixed her abode on his head : he was clothed, as with a cist, with the wounds of leprosy.

19. His locks flowed, like a mantle, over his body : his only sandal was the callus of his feet.

20. In his hair stuck a comb of *Arabian* thorns : a robe of sand from the desert covered his back.

21. 'O thou, said *the Prince*, who hast been lost in the valley of sorrow ; dost thou not wish me to give thee the object of thy passion,

22. 'To exalt thee with dignity and power, to bring *Laila* before thee gratifying thy soul ?

23. 'No, no ; answered he, far, far is it from my wish, that an atom should be seen together with the sun.'

24. 'Speak truly, replied the Prince, art thou not willing to recreate thyself on the smooth plain of that beautiful cheek ?

25. 'O!

25. ' Or hast thou no inclination to enjoy her charms ? I adjure thee, by  
' the soul of LAILI', to declare the truth !'

26. He rejoined : ' O chief of men with generous hearts, a particle of  
' dust from thy gate is a diadem on my head.

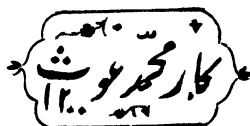
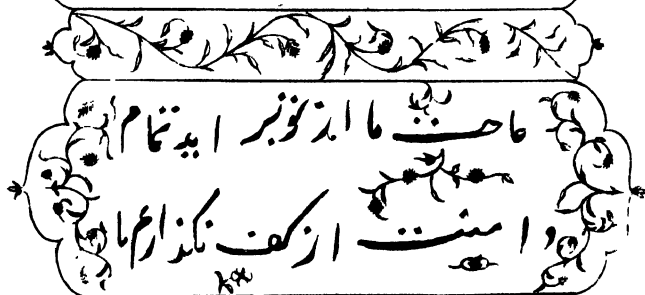
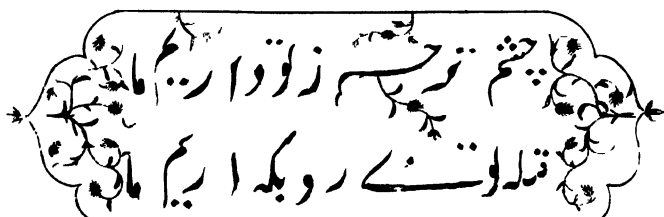
27. ' The pain of my love for LAILI' is sufficient for my heart : a wish to  
' enjoy her presence *thus* would be injustice.

28. ' To gratify this contemptible soul of mine, a single ray from that  
' bright luminary would be enough.'

29. He spake, and ran towards the desert, his eye weeping, and his eye-  
lashes raining tears.

These couplets would fully answer the purpose of showing the method, in  
which *Persian* may be written according to the original characters, with some  
regard also to the *Isfahani* pronunciation ; but, since a very ingenious artist,  
named MUHAMMED GHAV'ATH, has engraved a tetraſtich on copper, as a spe-  
cimen of his art, and since no moveable types can equal the beauty of *Persian*  
writing, I annex his plate, and add the four lines, which he has selected, in  
*English* letters : they are too easy to require a translation, and too insignifi-  
cant to deserve it.

*Huwa'l aziz*  
*Chashmi terahhūm zi lō dārīm mā*  
*keblah tōyi rū bech ārim mā*  
*hājati mā āz to ber āyēd temām*  
*dāmenat āz caf nagūzārīm mā*







## VI.

The first specimen of *Hindî*, that occurs to me, is a little *Ghazal*, or love-song, in a *Choriambick* measure, written by GUNNA' BEIGUM, the wife of GHA'ZIU'LDI'N KHA'N, a man of consummate abilities and consummate wickedness, who has borne an active part in the modern transactions of Upper *Hindustân*.

مردہ یا بوسی ہی	اب تمنا کو یہاں	مردی ہمسایہ سنین سار	ہمسایہ ہی
صخرہ سینہ میرا جاوہ	طاووس ہی	اب کثرت داغ غم خوابی	تمام
ای حنا کسکی چہی خواہش	یا بوسی ہی	ہی میری طرح جگر خون تیرا مدت	سی
جس لب زخم نی شمشیر تیری	چوسی ہی	عوض درد مری سی وہ بہری	ہن ساری
ہن بہہ سچ ماننی کی خوان سی	تو تک خوسی ہی	تہمت عشق عبت کرتی ہن	مجبہر منت

*Mudda'î hemse sokhan sâz bi salûsi hai*  
*ab tamennâ cò yehân muzhdei mâ'yûsi hai*

*âh ab casrati dâghî ghemi khûlâ'î se temâm*  
*âf'fai sinah mîrâ jilwâi fâ'ûsi hai*

*hai mîrî farâh jigar khûni tîrâ muddatse*  
*ai hînnâ cisci tujhê khwâhishi pâbûsi hai*

*âwâzi derd mez se wah bherê haiñ sârê*  
*jis lebi zahm ne shemshîrî tîrî chûsi hai*

*tohmati ishk âbas cartè haîn mujhper Minnat*  
*hâîn yeh sech milnè cî khûbân sè tù tuc khûsî hai.*

### The Translation.

1. My beloved foe speaks of me with dissimulation; and now the tidings of despair are brought hither to the desire of my soul.

2. Alas, that the smooth surface of my bosom, through the marks of burning in the sad absence of lovely youths, is become like the plumage of a peacock.

3. Like me, O *Hinna*, (the fragrant and elegant shrub, with the leaves of which the nails of *Arabian* women are dyed crimson,) thy heart has long been full of blood: whose foot art thou delicious of kissing?

4. Instead of pain, my beloved, every wound from thy cimeter sucks with its lips the sweetness, with which it is filled.

5. The suspicion of love is vainly cast on MINNAT—Yes; true it is, that my nature rather leads me to the company of beautiful youths.

Thus have I explained, by observations and examples, my method of noting in *Roman* letters the principal languages of *Asia*; nor can I doubt that *Armenian*, *Turkish*, and the various dialects of *Tartary*, may be expressed in the same manner with equal advantage; but, as *Chinese* words are not written in alphabetical characters, it is obvious, that they must be noted according to the best pronunciation used in *China*; which has, I imagine, few sounds incapable of being rendered by the symbols used in this essay.

## II. ASTRONOMICAL

## II.

## ASTRONOMICAL OBSERVATIONS

*in FORT WILLIAM, and between MADRAS and CALCUTTA.*

BY COLONEL THOMAS D. PEARSE,

COMMANDANT OF THE ARTILLERY, AND SECOND IN COMMAND OF THE BENGAL ARMY.

**I** BEG leave to communicate to the Society some Astronomical Observations which I made at different times in *Fort William*.

The clock I used from December 1775, was made by ELICOT: it beats dead seconds: there is one hand for minutes, and the hours revolve with the plate fixed to the hour wheel.

The pendulum can be lengthened without stopping the clock, by means of a screw, which supports the spring by which the pendulum hangs. And the pendulum is described in the 47th volume of the Philosophical Transactions, page 479. The clock-case is firmly screwed to the wall. The transit instrument was made by Sisson; it is four feet long, and has a double object glass. This is supported by two iron bars, which are joined to a square frame, that lies two feet under the floor, buried in brick work.

The upright bars are protected by a case of wood, which is fixed to the house, without touching them in any part.

At first I used the cornice of the Commandant's house to adjust by; but afterwards a slider, with a slit in it, was put up in the area of the fort, near

the same place, behind which I could place a light to adjust with by night. There was another object also to the south, about 1500 yards off, which I could use by day; and both these were fixed when the transits by telescope and equal altitudes agreed; and were examined from time to time.

I had only a tolerably good HADLEY's quadrant and quicksilver, till December 1776, when I was lucky enough to get an 18 inch land quadrant, made by RAMSDEN, with a micrometer, to subdivide the nonius. This inverts, and is capable of the nicest adjustments. My first telescope was an 18 inch reflector, made by GREGORY.

In August, 1777, I obtained Mr. SMITH's refractor, made by DOILOND, with a triple object glass, and a double object glass micrometer. And I made a polar axis for it of brass with rack work, and a declination circle not divided, which also is racked; to which, when the micrometer was used, the telescope was fixed.

I likewise communicate observations made by myself chiefly, and by Lieutenant COLEBROOKE for me, to ascertain the longitudes and latitudes of places between *Madras* and *Calcutta*.

Going to *Madras* in 1782, I used an HADLEY's octant and quicksilver, which I shall here describe.

The octant had a wooden index. I separated the part which carries the speculum from the arm; then fixed it into a lath, and turned it on its own centre: it was three tenths of an inch thick; the thickness was divided into three parts, and then the edge was turned away on each side: so that the whole piece of wood became like three wheels of different diameters  
joined

joined together on their flat surfaces, and the middle one was the biggest, that below was the next in size, and the upper one was the least, and only equal to the brass plate on which the speculum was screwed.

A plate of brass, nearly one tenth thick, broad enough to admit of a hole as big as the under circular part of the turned wood, and to afford a rim of half an inch broad, was then fixed into the lath, and had a hole turned in it of that size; on one side it had an arm, as broad as the wooden index was.

A second plate of the same kind was also prepared; but the hole was larger, though less than the middle part of the turned wood.

The turned piece was then fixed to the octant by its pin, and the plate with the smaller hole, beneath it. As they fitted very nicely, the brass plate turned upon the wood round the centre of the octant, if that were held fast; and both turned on the centre pin, if they were pressed together.

The plate, with the large hole, was then laid above the turned wood, its centre coinciding with the common centre; the wooden arm of the index had the end nearest the centre cut away, above and below, equal to the thickness of the plates of brass: it was there fixed to the octant in the same manner as before it was cut off from the centre, and the brass plates were drilled and rivetted to it.

When these plates were pressed together, they held the turned piece as it were in a vice: when they were forced asunder, the turned piece might be moved independently; and there were in the direction of the radius two screws, one beyond the speculum, and one between it and the nonius,

for the purpose: they had button heads, and their shanks were as high as the top of the index speculum.

On the back of the octant there was a screw with a button head, the thread entered the centre pin, and the shoulder pressed upon the plate which keeps that pin in its place.

The back screw and vice screws being slackened, the index speculum was brought parallel to the horizon glass, then the vice screws were turned to join the speculum to the index, as before the alteration was made.

To extend the power of the octant occasionally, it was nicely adjusted; then the index was carried to  $90^\circ$ , and there screwed to the limb: next, the back screw of the centre pin was forced, till by its pressure, the speculum piece was held fast; after that, the vice screws being slackened, the index was carried back to  $0^\circ$ , and there screwed to the limb. Whilst it was in this position, the vice screws were again turned, which fixed the speculum piece to the index, and then the back screw being slackened, the speculum followed its motions. When it was used, the index shewed the angle which was to be added to  $90^\circ$  for the angular distance.

By this contrivance, with an octant, I could take angles of  $150^\circ$ : and consequently meridian altitudes as far as  $75^\circ$ : and if the horizon glass and telescope could have been made to slide nearer towards the centre, it would have been increased still further.

In RAMSDEN'S new quadrant there is a screw to adjust the horizon glass, and bring it parallel to the other: provided the index speculum is perpendicular to the limb, this is all well; but if that be inclined, as soon as the index quits  $0^\circ$ , there will be an error in the angles observed. I found

found it so experimentally, and corrected my quadrants accordingly, by turning the horizon glass round its own axis, then having adjusted, as usual, the error side ways was corrected by moving both glasses, by means of their adjusting screws, and dividing the error between them. If, when the horizon glass was restored to its proper position, there still was a lateral error, the operation was repeated. I do not find any mention of this in any of the instructions for using HADLEY'S instruments that I have seen.

The horizon was artificial, invented for the occasion, and consisted of a wooden trough about half inch deep, (or rather more,) filled nearly with quicksilver, which served to float a plate of thick glass, the under surface of which had been unpolished and blacked, that only one image might appear. This needs not any adjustment; the only requisite is, that the glass be equally thick all over, and smooth: that, which was used, was a part of a very large looking glass, that had been broken by accident.

The watch was a time keeper, by BROOKBANK, which goes without winding up, and is tolerably good, considered as a clock watch sent to India.

The telescope had a double object glass, with a brass stand, and was made by GREGORY: it magnifies 80 times, but, like all of this construction, that I have seen, it had a dark speck in the middle, and was not equally good in the whole field.

In the way back, we had a land quadrant, of 15 inches radius, made by B. MARTIN, and sent out by the *India Company*. It was used by Mr. HURST in the transit of *Venus*. This could not be inverted. But to destroy the effects of collimation and error of level, the latitudes are all determined by stars taken north and south of each place, as the observations will shew.

T. D. PEARSE.



## ASTRONOMICAL OBSERVATIONS made at CALCUTTA.

By T. D. P.

## JUPITER'S FIRST SATELLITE.

## IMMERSIONS.

Date.	Apparant time conect.	Time by Eph- emeris.	Longitude.	
	H. M. S.	H. M. S.	H.M.S.	
1774, 14th Oct.	12.32.25	6.39.00	5 53.25	<i>Jupiter</i> very nearly vertical, and the glafs shook much.
23d do.	8.57.15	3.03.17	5-53.58	
1776, 13th Nov.	13.58.56.3	8.04.46	5 54.10.3	
29th.	12 09.39	6.15 53	5-53.46	
6th Dec.	11.00.32.6	8.00.38	5-53.54.6	
13th.	15.50 59.5	9 57.02	5-53-57.3	
13th.	10 18 31	4.24.35	5-53 56	
22d.	12 08.47.6	6.14.50	5-53.57.6	
31th.	8.26.54.1	2.32.49	5-51 03.1	
1777, 16th Jan.	8.51.19.6	2 57.11	5 54 08.0	
27th Dec.	9.38.58.8	3 45.01	5 53.57.5	<i>Dollond's</i> triple object glafs.

## EMERSIONS.

1774, 29th Dec.	11.25.47	5.31.52	5-53.45	<i>Dollond's</i> triple object glafs. Ditto. Ditto. Ditto.
1777, 30th Jan.	12 36 11.8	6.42 30	5-53 41.8	
1778, 15th March.	8.40 49.6	2.47.41	5 53.08.6	
7th April.	9.00.02.2	3 07.00	5-53.02.2	
14th	10.56.35.1	5-02.30	5-53.05.1	
1779, 3d May.	12.07.38.8	6.14 37	5-53.01.8	

## SECOND SATELLITE.

## IMMERSIONS.

1776, 4th Dec.	10.53 23.5	4 58 08	5 55.21.5	<i>Emerg'd</i> from behind the body 9.27.04.3, and was quite clear of the body at 9.28.55.3. <i>Dollond's</i> triple object glafs.
11th	13.25.50.4	7.30.42	5-55.08.4	
18th	10.58.21	10.03.14	5-55.07.0	
29th	7.18 01.4	1-52.27	5-55-34.4	
1780, 11th July.	9.34.17.5	3 11.33		

## EMERSIONS.

## EMERSIONS.

Date.	Apparent time	Time by Ephe-	Longitude.	
	corrected. H. M. S.	meris. H. M. S.	H. M. S.	
1775, 20th Dec.	8.47.47.7	2.53.18	5.54.23.7	Here the tables seem to have been corrected. <i>Dollond's</i> triple object glafs.
1777, 2 <sup>d</sup> Jan.	7.32.44.3	1.37.41	5.55.03.3	
26th April.	7.20.34.1	1.25.43	5.54.51.1	
6th May.	9.59.28.9	4.04.11	5.55.17.9	
1779, 8th May.	11.45.53.5	5.52.13	5.53.10.5	

## THIRD SATELLITE.

1774, 10th Nov.	13.12.30	7.18.17	Emerfion.	But I thought I faw it about a minute before; however it was fo very dim that I cannot be certain.
1775, 28th Jan.	7.28.58.5	1.33.45	Immersion.	
	9.04.20	3.07.49	Emerfion.	
1776, 3d Nov.	10.55.20.2	5.00.14	Emerfion.	I think I might have feen it earlier, if I had expected it to emerge at a greater diftance than one Satellite appeared, which was the cafe. <i>Dollond's</i> triple object glafs. Rather doubtful. I thought I faw it, but <i>Jupiter</i> was fo very bright it dazzled my eyes.
17th	15.31.51.3	9.42.37	Immersion.	
23d Dec.	11.10.33.6	5.19.58	Immersion.	
1777, 26th Jan.	10.13.11.2	4.22.53	Emerfion.	
1778, 3d April.	9.21.24.9	3.33.12	Do.	
1779, 2d May.	8.44.37.5	2.54.27	Immersion.	
	45.26.5			
	11.32.80.6	5.44.27	Emerfion.	

## FOURTH SATELLITE.

1776, 2d Nov.	13.23.14.0	Emerfion.	At the time of this obfervation, there was a very fmall ftar a very little to the weft of the wefternmoft Satellite.
1777, 8th Jan.	9.28.49.5	Immersion.	
25th	7.23.02.0	Emerfion.	
1778, 9th May.	8.25.13.0	Emerfion.	<i>Dollond's</i> triple object glafs.

Oth<sup>r</sup>

*Other Observations of Jupiter and his Satellites.*

1776, 22d November, between 9 and 10, I saw a very small star, not bigger than a Satellite, very near to *Jupiter*. The configuration thus,



At 12.9.39, the configuration was thus,



that is, the two outermost Satellites had gone forward, and *Jupiter* back, in right ascension, visibly.

30th November, the configuration was thus,



that is, the star was north; distant from the limb in declination about the quantity of the lesser axis. In right ascension the star was advanced further than *Jupiter's* centre, about a fifth of the axis. Some time after I found that the little Satellite, which was below the limb, had immersed into the disk; and soon after I saw the shadow of that Satellite upon the Great Belt. I observed the shadow go off the disk, and about an hour after that, the Satellite emerged a little to the north of the Great Belt.

The

The times were noted, but the book was destroyed by accident. When *Jupiter* passed the meridian, I could not see the star in the transit telescope, but about 4' afterwards the configuration was thus,



W

that is, a line drawn from the star to *Jupiter's* centre, made an angle with the great Belt, which I judged to be about  $41^\circ$ , and in that direction, it was about the quantity of the lesser axis distant from the limb; so that *Jupiter* had moved back about  $\frac{3}{4}$  of his diameter, from the time I first saw him to night till he passed the meridian.

1776, 8th December, my clock was stopped by an earthquake, which spoilt the observation of the immersion of *Jupiter's* first satellite.

1776, 23d December, an Emission of the first Satellite from the Disk.

				Apparent time 20.11 7.
The shadow touched the middle of the edge of the great Belt, and made a visible notch in it	-	-	-	11.26.00 <sup>b</sup>
It was still visible	-	-	-	28.05
It vanished	-	-	-	30.50
Satellite at the edge of the limb	-	-	-	53.25
In contact emerged	-	-	-	58.53

1777, 25th January, 7.23.00,6, I saw a small star a little to the west of

the westernmost Satellite, not so bright as either of them; it was hardly visible through the reflector.

Configuration thus,



26th, I could not find the star at 7.11.

29th May, *Jupiter's* second Satellite immersed behind the disk 7.25.18,<sup>7</sup>

1779, 2d May, an Immersion of *Jupiter's* first Satellite into the disk.

					Apparent time correct <sup>h</sup>
In contact	-	-	-	-	11.31.37,6
Immersion doubtful		-		-	35.19,6
Certain	-	-	-	-	35.50,6

If the immersions and emersions of this nature were calculated so as to let astronomers to look out for them, *Jupiter's* satellites might be rendered more useful than they now are in regard to longitudes by land; and that too, whether the calculations are accurate or erroneous.

For I mean to use an immersion or emersion of any kind, only to note an instant for taking the altitude of *Jupiter* at the place of observation.

If the instrument be of equal powers, and the eyes of equal strength, then certainly the altitudes will be taken by every person, who shall observe

serve the same phenomenon at one and the same instant of time ; and hence the distance of *Jupiter* from the meridian of each will be known to seconds, if we suppose the latitude known before hand.

And if the telescopes of quadrants could be made sufficiently powerful to observe the satellites, then a single observer, at any place, could perform the whole without trouble or difficulty, and would only need a common watch, and a little more patience than would be requisite if the watch were perfect and calculation true.

But supposing the telescopes and quadrants as they are, and two observers at each place, one employed with the satellite, and the other with the quadrant, then the latter must carefully keep the body of *Jupiter* on the line of altitude till the other tells him to stop, which is to be done at the instant of observing the expected phenomenon.

By this mode, a degree of longitude may be measured with as much accuracy as a degree of latitude, and it is what I have in contemplation to perform, as soon as I can get the requisite instruments.

*Remarks on some erroneous Observations of Jupiter's first Satellite.*

In 1778, I took notice, that, when *Jupiter* is very near the opposition, the observations are not to be depended on, and that the satellite vanished without changing colour. The same happened in 1779, 1780, and again in 1784, at *Beemulchisa* ; therefore, I have put down the times of such observations, as they are reduced to apparent time, from the known deviation of the clock from mean time. The transit instrument was ex-

mined by stars that pass over the zenith, and by others north and south, and by equal altitudes, all which shewed it was as nicely in the meridian as it well could be.

In 1779, on the 3d March, I observed  $\tau$  and  $\mu$  Geminorum, and the deviation was the same as that derived from the transits of the sun on the 23d February and 5th March. In the observation of the moon 23d November following, the accuracy of its position was ascertained, so that the times were correct; and the errors depend on something at the Satellite and planet. Perhaps *Jupiter's* atmosphere may be so dense as to prevent the free passage of the diminished light soon after the beginning of an eclipse, or even before it. If so, these observations may tend to clear up that point, and to measure the extent of that atmosphere.

Date.	Apparent time correct	Ephemeris.	
	H. M. S.	H. M. S.	
1778, 4th Feb.	7.51.10.3	1 58.08	} These two were observed at <i>Dumdum</i> , but the time was taken from the transit instrument by a watch, carried out before and back after, and compared with the clock.
1779, 23d do.	9.02.51.0	3.10.01	
2d March	10.58.15	5.05.17	
9th do.	12.53.08	7.01.07	
11th do.	7 20.35.3	1.30.10	
1780, 13th March.	10.10.47.7	4.20.23	

All these observations were made with *Dollond's* triple object glass.

### Observations of Venus.

1776, 2d January, at 7.<sup>h</sup>55<sup>m</sup> in the morning, I measured the distance between *Venus* and the *Sun* 46°.32'.

I was

I was informed the natives were viewing it with astonishment, but I did not see it with the naked eye. Through the little telescope of my HADLEY's quadrant it appeared as bright as *Capilla*.

				Apparent time correct. <i>b</i>
1777, 1st July, <i>Venus</i> passed the meridian	-	-	-	21.30.41,5
14th, <i>Venus</i> visible to the naked eye, and has been so three days.				
Passed the meridian	-	-	-	21.01.02,0

*Distances from the Sun, measured with an HADLEY's Quadrant.*

West limb	41.57	-	-	-	<sup>A</sup> 21.21.58,5
East do.	42.29	-	-	-	25.08,5
15th, Passed the meridian		-	-		20.59.29
16th, Do.		-	-		58.08,5
17th, Still visible.					

*Distances measured as before.*

From nearest limb	<sup>δ</sup> 42 31	-	-	-	<sup>A</sup> 0.08.10
From furthest do.	43.03	-	-	-	0.12.14

1780, 18th March, an Appulse of *Venus* to *Mars*.

<i>Inch.</i>	<i>Non.</i>	<i>Distances.</i>			Apparent time correct. <i>b</i>
2,45	" 3 =	15.17,2	-	-	7.39.33,9
2,45	" 8 =	15.20,9	-	-	44.33,9
2,45	" 5 =	15.18,7	-	-	49.33,9

N. B. The scale of the micrometer is divided into twentieth parts of an inch, and the nonius subdivides these into twenty-five parts each.

The



The next morning the *Sun's* diameters were measured

		<i>Inch.</i>		<i>Non.</i>
Horizontal	-	5,15	"	17,25
Vertical	-	5,10	"	21
<hr/>				
Mean	-	5,15	"	06,625
Error of micrometer			+	4
<hr/>				
		5,15	"	10,625

*Sun's* diameter by Ephemeris  $32'.11'',6$ , from which the distances were calculated.

19th March, *Difference of Declinations and right Ascensions.*

<i>Inch.</i>	<i>Non.</i>					<i>Apparent time correct.</i> <i>h</i>		
4,20	"	00	=	26.08,7	at	-	-	7.41.51,4
<i>Mars</i> passed the vertical wire						-	-	43.09,4
<i>Venus</i> do.						-	-	45.16,1

*Mars* was south of *Venus*.

*Observations of Mars.*

*An Appulse of Mars to \* Libræ.*

<i>Distances.</i>						
<i>Inch.</i>	<i>Non.</i>					<i>h</i>
1,00	" 19	=	6.18,5	-	-	10 50.05
1,00	" 17	=	6.17,0	-	-	10.58.05

The star was west of *Mars*.

*Observations of the Moon.*

1775, 12th January, an Occultation of Aldeheran.

Immersion	-	-	-	-	-	<i>h</i>
						8.54.55
						I believe

I believe the watch was set by equal altitudes, but I have lost the book in which the entry was made, and have only a copy of my observations as a register of this and the next that follows.

*15th February, an Eclipse of the Moon.*

End  $10.15.00,5$ , apparent time correct.

*1776, 3d March, an Occultation of Regulus.*

Not having an ephemeris at the time, the observation was accidental, and consequently not prepared for. The transit instrument was but lately put up, and had not been much used, but it was the only resource for time: accordingly, it was adjusted truly as to level and wires, but it was not in the meridian accurately. Therefore the transits of several stars were taken to determine the position of the instrument, and the error of that being known, the times could be corrected by a very easy rule, which I subjoin. Let  $x$  be the error in seconds at the horizo,  $a$  and  $b$  the sines of the zenith distances of two stars,  $A$  and  $B$  the sines of the polar distances,  $d$  the difference of the errors of the clock, as found from the observed and the calculated transit of those two stars. Then  $\frac{x \cdot a}{A}$  will be the space at the equator for the equation to correct one, and  $\frac{x \cdot b}{B}$  the same for the other; and the sum of these two will be equal to  $d \times 15$ . or, which is the same thing,  $\frac{x \cdot a}{15 \cdot A} + \frac{x \cdot b}{15 \cdot B} = d$ . Whence for all small angles

$$x = \frac{15 \times d \times A \cdot B}{a \cdot B + b \cdot A}.$$

$\zeta$  and  $\gamma$  *Leonis* were the two stars that were relied on for time and position, because they pass so nearly at equal distances from the zenith, that the mean of their errors of the clock would be so near to the

the true one, that any clock yet invented could not shew the difference actually.

The difference of their errors was 5",6 and thence the error of the transit instrument was only 1246",16 at the horizon, and the distance of the wires of the telescope is 1478"

	<i>Times of passing the Middle Wire.</i>	<i>Equation for the Error of the Instrument.</i>	<i>Passage by Calculation.</i>	<i>Error of Clock.</i>
3d March,				
▷ Well Limb	10.58.19,5	— 15,08		
α Leonis	11.01 45,0	— 7,16	10.54.56,8	6 41,04
α Leonis	03 11	— 14,07	56.15,9	6.41,03
ζ The Northern	10 33			
ζ The Southern	10.39	+ 3,01	11.04.00,6	6 41,41
γ The Southern	14.04			
γ The Northern	14.08	— 2,59	07.24	6.41,41
δ Urfæ Majoris	13 08.48	+ 92,27	13.03.43,9	6.36,37
ε Urfæ Majoris	48.40	+ 92,01	43.34	6.38,00
Immerfion,	14.02.39,5			
It was emerged, but I did not see the Emerfion.	52.30			

6th March, equal Altitudes, by an HADLEY's Quadrant and Quicksilver.

*Quadrant.*

30.00	rifing	-	20.29.41	
	falling	-	27.42.30	6.05,5
30.30	rifing	-	20.32.14	
	falling	-	27.39.56	6.05,0
			Mean	- 6.05,25
			Equation of equal altitudes	- 7,10
				5.58,15

This

This compared with the error of the clock by  $\zeta$  and  $\gamma$ , shews that it was loosing  $17''.06$  daily; at which rate, to the time that  $\epsilon$  Urfæ Majoris passed the meridian, it must have lost  $1''.95$ , and the error by  $\epsilon$  ought to have been  $6'.39''.4$ . The difference is only  $1''.4$ , which is not greater than the errors of observation may sometime be in stars of great declination.

<i>Result.</i>					<i>Apparent time correct.</i> <i>b</i>
West limb passed the meridian	-	-	-	-	10.51.23
Regulus	-	-	-	-	56.15.5
Immersion	-	-	-	-	13.56.00.15
And emerged in less than 50'.					

1776, 30th July, an Eclipse of the Moon.

Beginning of total darkness.

					<i>Apparent time correct.</i> <i>b</i>
By eye	-	-	-	-	17.00.49
By telescope	-	-	-	-	01.16
Clouds prevented any other observations.					

1777, 20th January, an Occultation of  $\zeta$  Geminorum by the Moon.

					<i>Apparent time correct.</i> <i>b</i>
Immersion	-	-	-	-	13.37.38.6

23d January, an Eclipse of the Moon.

					<i>Apparent time correct.</i> <i>b</i>
Eclipse began	-	-	-	-	8.41.21.7
Shadow well defined	-	-	-	-	44.33.7
Mare Humorum touched	-	-	-	-	49.13.7
Grimaldus, do.	-	-	-	-	50.43.7
VOL. I.			L		Grimaldus

					<i>Apparent time corre. h</i>
Grimaldus passed	-	-	-	-	53.18,7
Mare Humorum, do.	-	-	-	-	53.33,7
Tycho's dark circle touched	-	-	-	-	56.13,7
Tycho's body, do.	-	-	-	-	56.40,7
Copernicus, do.	-	-	-	-	9.26.28,7
Do. passed	-	-	-	-	33.23,7

Going off again.

Copernicus passed	-	-	-	-	10.12.58,5
Grimaldus, do.	-	-	-	-	21.23,5
Mare Humorum touched	-	-	-	-	36.17,5
Aristæus passed	-	-	-	-	37.33,5
Mare Humorum, do.	-	-	-	-	47.23,5
Regiomontanus, do.	-	-	-	-	11.00.08,5
Tycho's body	-	-	-	-	02.33,5
Tycho's dark circle passed	-	-	-	-	05.38,5
Vendelin, do.	-	-	-	-	12.23,5
Faint Penumbra remained	-	-	-	-	32.25,5
Limb clear. End	-	-	-	-	33.33,5
☾ West limb passed the meridian	-	-	-	-	12.03.22,7
East do. do.	-	-	-	-	05.38,2

The times are those of the shadow's edge, unless it be otherwise expressed.

1777, 13th February, an Occultation of  $\mu$  Ceti.

					<i>Apparent time corre. h</i>
Immersion	-	-	-	-	7.53.46,7

I was very certain of the time of the immersion. Five seconds before it, the star began to change colour and to loose light sensibly; one second before the

the immersion, it was considerably broader and redder than at first; and the light was not so strong as before.

This supports the supposition of an atmosphere round the moon, though it does not extend to any great distance. It has been doubted, and is, I believe, not yet absolutely admitted. But our atmosphere may be doubted by an inhabitant of the moon, for if to its greatest extent, supposed 45 miles, it were of the same density as at the surface of the earth which is not the case, it would not subtend a minute, as the earth is 8000 miles in diameter, and the greatest parallax only 62'.

1777, 16th May, an *Appulse of the Moon to Scorpii*.

				Apparent time correct <sup>d</sup>
				<sup>h</sup>
West limb passed the meridian	-	-	-	7.59.50,1
Scorpii do.	-	-	-	8.00.02,1

By the arch of the transit instrument, the star was 10' from the limb.

1779, 1st May, an *Appulse of the Moon to Mars and Saturn*.

Having brought the *Moon's* limb to run along a wire of declination,

				Apparent time correct <sup>d</sup>
				<sup>h</sup>
The eastern limb passed the vertical wire	-	-	-	10.23.09,5
<i>Saturn</i> passed the same	-	-	-	10.23.21,5

*Saturn* did not come within the scale of the micrometer.

*For the right Ascensions.*

				Apparent time correct <sup>d</sup>
				<sup>h</sup>
<i>Mars</i>	}	Passed the meridian at	-	12.55.42
<i>Saturn</i>				56.34
Eastern limb				57.36

*Distances of the Moon and Mars.*

<i>Inch.</i>	<i>Non.</i>		<i>Distances of the Moon and Mars.</i>			<i>Apparent time correct.</i>
4.70	" 08,5	=	28.40,3	-	-	13.18 42,5
4,65	" 21	=	28.31,1	-	-	26.34,5
4,65	" 15	=	28.26,7	{ Mean of the three times and the same measure }		
4,65	" 21	=	28.31,1	-	-	31.53,5
4,65	" 21	=	28.31,1	-	-	36.49,5
4.70	" 05	=	28.37,7	-	-	41.06,5

1779, 3d May, an Appulse of the Moon to  $\alpha$  Ophiuchi.

*Difference of Declination.*

<i>Inch.</i>	<i>Non.</i>				<i>Apparent time correct.</i>
4,70	" 17	=	28.09,9	- - -	10.22.58,1

The star was to the west of the Moon's horn from which the distance was measured, because the micrometer could not take in the limb.

<i>Inch.</i>	<i>Non.</i>				<i>Apparent time correct.</i>
4,60	" 17	=	28.09,9	- - -	10.22.51,1

*Examination of the Micrometer.*

	<i>Inch.</i>	<i>Non.</i>
1st May, 19.29. <sup>b</sup> lesser diameter of the Sun	5,2	" 13
Again,	5,2	" 15
Greater diameter	5,2	" 23
Again	5,2	" 24
Hence mean diameter	5,2	" 17,5

There are twenty-five nonius to divide one twentieth of an inch.

When the limbs coincided the zeros agreed.

The ephemeris gives 15'.54",6 for the semi-diameter, therefore one nonius is equal to 0",7294.

1779, 23d November, an Eclipse of the Moon.

	<i>Apparent time correct.</i>
Beginning	12.02.33,0
Shadow well defined	03.36,0
Aristarchus	10.37,9
	Infula

						<i>Apparent time correct.</i>
						<i>h m s</i>
Infula Ventorum	-	-	-	-	-	12.14.32,9
Copernicus	-	-	-	-	-	21.18,9
Mare Vaporum	-	-	-	-	-	32.07,8
Bright spot in Mare Vaporum			-	-	-	34.27,7
Tycho's body touched	-	-	-	-	-	35.29,7
Mare Serenitatis, do. the border			-	-	-	35.47,7
Tycho passed	-	-	-	-	-	36.52,7
Mare Tranquilitatis touched	-	-	-	-	-	40.17,6
Ariadæus	-	-	-	-	-	41.37,6
Mare Serenitatis passed		-	-	-	-	44.07,6
Meerob	-	-	-	-	-	51.37,5
Mare Crisium touched	-	-	-	-	-	52.37,5
Do. passed	-	-	-	-	-	56.40,4
Total darkness by eye		-	-	-	-	13.00.37,5
By telescope	-	-	-	-	-	01.41,3
Do. end by telescope		-	-	-	-	14.40.13,3
By eye	-	-	-	-	-	41.16,3
Grimaldus passed	-	-	-	-	-	43.06,3
Aristarchus	-	-	-	-	-	50.42,2
Infula Ventorum touched	-	-	-	-	-	53.46,2
Passed	-	-	-	-	-	54.20,2
Copernicus	-	-	-	-	-	15.02.44,1
Tycho's body touched	-	-	-	-	-	04.56,0
Passed	-	-	-	-	-	06.23,0
Mare Crisium touched	-	-	-	-	-	32.22,7
Passed	-	-	-	-	-	35.55,7
Mare Fæcunditatis passed		-	-	-	-	37.23,6
End by telescope, doubtful	-	-	-	-	-	39.45,6
Certain	-	-	-	-	-	42.00,6

The



The apparent times here noted in these observations were derived from the mean times. The difference between the clock and mean time being applied to the hours shewn by the clock. And as the difference or equation was derived from the transit instrument, here follows an examination of its position.

	<i>Transits over the meridian the wire by clock.</i>	<i>Difference between the clock and mean time.</i>
22d November,	<i>b</i>	
☉ West Limb	23.42.34	
East do.	44.53	
Center	23.43.43,5	
Eqn. time	0.13.19,5	
23d November,		—2.57 to be add- ed to all the tran- sit hours.
α Arctus	9.42.02	
☉ West Limb	11.38.28	
East do.	40.51	
Rigel	12.50.41	
Bellatrix	13.00.01	
Castor	15.06.51	
Procyon	14.05	
1st December		
☉ West Limb	23.45.26	
East do.	47.47	
Center	23.46.36,5	
Eqn. of time	10.17,7	—3.05,8

*Equal Altitudes with the Quadrant which has only one Wire.*

<i>N. B. Before and after this last transit.</i>	<i>b</i>	<i>Another altitude not moved.</i>
Rising U limb	20.16.41	20.23.47
L limb	20.19.38,5	20.26.46,5
Falling L limb	27.13.27	27.06.17
U limb	27.16.23	27.09.19
Center	23.46.32,4	23.46.32,4
Equation of equal altitudes		+ 4.37
		23.46.36,77

*Apparent time correct.*

1780, 18th February, ☽ East limb passed the meridian	-	-	10.39.31,6
15th April, ☽ West limb past the meridian	-	-	9.17.34

*5th August, an Appulse of the Moon to Jupiter.*

☽ West limb passed a circle of the meridian	-	-	7.14.44
<i>Jupiter's</i> western limb	-	-	14.48
Eastern do.	-	-	14.58
Center	-	-	18.49
☽ West limb	-	-	00.53
<i>Jupiter's</i> center	-	-	25.06
☽	-	-	25.19
<i>Jupiter's</i> centre	-	-	42.31
☽	-	-	43.08
<i>Jupiter</i>	-	-	51.21
☽	-	-	52.15
<i>Jupiter</i>	-	-	8.42.22
☽	-	-	44.42

The difference of declination of *Jupiter* and the nearest horn of the

<i>Moon</i> , was	-	9'.01",4	at	-	-	7.28.40
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*Distances of Limbs.*

14.33,2	-	-	-	-	7.32.12
15.01,5	-	-	-	-	35.36
15.32,7	-	-	-	-	38.53
16.25,9	-	-	-	-	44.31
17.06,5	-	-	-	-	48.16
30.58,6	-	-	-	-	8.35.49

OBSERVATIONS



## T R I V A T O O R E.

Observations by T. D. P. 1783.

☉ On the meridian, December 5,	-	<sup>Day.</sup> <sup>b</sup> 23.33.52,5,	flow 26.07,5
☉ On the meridian, December 6,	-	23.35.53,1,	flow 24.06,9
Daily gain	-	-	2.00,6

The equation of equal altitudes was applied.

*An Emersion of Jupiter's first Satellite.*

6th December, by watch emerged	-	<sup>h</sup> 6.31.53	
Too flow at noon	-	+26.07,3	
Gain till observation	-	-34,4	
		<hr/>	
Emerfion	-	6.57.25,9	
Ephemeris	-	1.36.52,0	
		<hr/>	
Longitude in time	-	5.20.33,9	
in degrees	-	80.08.28,5	
☉ On the meridian, December 28	-	23.26.37	
Equation of E. A.	-	-1,9	
		<hr/>	
		23.26.35,1,	flow 33.24,9

☉ On the meridian, December 30	-	23.23.40,3
Equation of E. A.	-	— 1,9
		<hr/>
		23.23.38,4, flow 36.21,6
Daily loss	-	88",4

*An Emersion of Jupiter's first Satellite.*

29th December, by watch emerged	-	-	<sup>b</sup> 6.27.07
Too slow at noon	-		33.24,9
Loss till observation at 88,4	-		25,8
			<hr/>
Emersion	-		7.00.57,7
Ephemeris	-		1.40.44,0
			<hr/>
Longitude in time	-		5.20.13,7
			<hr/>
in degrees	-		80.03.24,6
The mean of the two longitudes	-		80.05.56,5

The distance between the flag in the fort, and the place of observation at *Trivatoore*, was determined by a long base measured in the sands, and by taking angles for trigonometrical calculations.

*Madras* flag, distance - - 2787,1 feet.

Bearing - - S. 10.33.50 W.

Which give difference of Longitude 50",5.

Latitude 4'.30",7.

*V I P E R E E.*

Having borrowed the quadrant that Mr. HURST used in the transit of *Venus*, I was desired not to alter its line of collimation till I had determined

ed

ed the quantity of error: those observations are in the tables of latitude. It was used in the survey to *Calcutta*.

As I intended to observe at this place, I determined its distance from the fort as accurately as I could by trigonometry. The result is:

*Madras* flag, distance - - 8072,2 feet.

Bearing - - S. 23.15,00 E.

Which give difference of Latitude 31",5

### M A D R A S.

Latitude of *Trivatore*, see table - - - 13.09.00,4

*Madras* south of it - - - — 4.30,7

Latitude - 13. 4.29,7

Latitude of *Viperee*, see table - - - 13.05.05,4

*Madras* south of it - - - — 31,5

Latitude - 13.04.33,9

Mean 13.04.31,8

Longitude of *Trivatoore*, mean - - - 80.05.56,5

*Madras* west of it - - - — 00.50,5

Longitude - 80.05.06,0

*W U N G O L E*, 1782, commonly called *O N G O L E*.

*Observations by T. D. P.*

14th November, double altitudes of the pole, with the small sextant made by RAMSDEN, and the artificial horizon.

<i>Watch.</i>	<i>Angles.</i>	
9.16.12	34.45.30	} these were with the small sextant.
21.00	47.30	
31.00	45.30	
<hr/> 49.00	<hr/> 46.30,	this was with the large sextant.
9.29.18	34.46.15	
	<hr/> 17.23.08	
	+ 2.40	* beneath meridian.
	— 2.58	refraction.
	<hr/> 17.22.50	meridian altitude.
	1.51.13	polar distance.
	<hr/> 15.31.37	Latitude.

16th November, with the octant double altitudes of the *Sun*.

	<i>Upper L.</i>	<i>Lower L.</i>
12.00.28	111.51.00	" " "
2.24	54.00	
4.14		110.48.20 M. A.
5.41	* 111.56.00 M. A.	
6.36		110.47.00
Observed altitude	-	55.41.05
Ref. and par.	-	— 34
		<hr/>
Meridian altitude correct	-	55.40.31
Declination	-	S. 18.49.05
		<hr/>
Co. Latitude	-	74.29.36
		<hr/>
Latitude	-	15.30.24

1784, The Latitude observed by T. D. P. (see observations at large) was,  
 $15^{\circ}.29'.16''$

This is inserted only to bring to test the accuracy of the octant, which is mentioned (page 58) in the introduction: and it appears, that by a single observation made with it, the Latitude was determined within  $1'.8''$ .

It serves also to shew that, though it is very difficult to take double altitudes of so faint a star, in low latitudes, even the polar star may be used to great advantage: and in these hot climates the stars only can be employed, for the *Sun's* heat at noon, after a long march, is really not to be borne by any constitution.

*MASULIPATAM, 1782. By T. D. P.*

27th October, ☉ diameter forward 33, } then set the speculum to  $90^{\circ}$ , and  
 backward 32, } shifted the index back.

Double altitudes of the *Sun's* lower limb, taken with the HADLEY'S octant and the artificial horizon.

<i>Watch.</i>	<i>Angles.</i>
12.19.21	120.52.20
20.32	120.55.20
28.17	121.21.00
30.40	121.23.30
31.38	121.24.00
32.34	121.25.40 Meridian.
34.23	121.23.20

Observed



Observed meridian altitude	-	-	L. L. 60.42.50
Error of quadrant	-	-	- 30
Semi-diameter	-	-	+ 16.10
Ref. and par.	-	-	- 27

Altitude - 60 58.03

Declination - S. 12.51.09

Co. Latitude - 73.49.12

Latitude - 16.10.48

28th October, quadrant the same as above.

The mode the same, double altitude - 120.45.00

Meridian altitude correct - 60.37.42

Declination - S. 13.11.55

Co. Latitude - 73.49.37

Latitude - 16.10.23

1st November, ☉ diameter, 34 forwards, } then set the speculum to  
33 backwards, } 90°

Time.	Upper L.	Lower L.
12.14.56	119.13.10	118.04.30 M. A.
15.33		
16.11	119.14.50 M. A.	

Observed meridian altitude	-	-	59.19.50
Ref. and par.	-	-	- 30
Error of quadrant	-	-	- 30

Meridian altitude - 59.18.50

Declination - S. 14.30.45

Co. Latitude - 73.49.35

Latitude - 16.10.25

The

The same day Lieutenant HUMPHRYS observed with a sextant made by RAMSDEN, about four inches radius; he made the angles of the lower limb  $118^{\circ}.09'.00''$ , and the error of his quadrant was  $-2'$ , which gave the latitude  $16^{\circ}.11'.05''$ . This was intended as a kind of test of the instruments, but it was not a fair one, and yet the result is closer than could be expected, considering the difficulty of reading the small one.

Mean of three latitudes with octant -  $16^{\circ}.10'.32''$

On meridian, October 29th,	$\overset{a}{00.04.56}$	too fast	-	$4.56$
By the small watch, ——— 30th,	$00.08.36,5$	-	-	$8.36,5$
————— 31st,	$00.12.37$	-	-	$12.37$
November 1st,	$00.16.36,5$	-	-	$16.36,5$

Examination of the large watch used at the observation of *Jupiter's* Satellite.

29th October, altered the spring and set it a-going at one o'clock.

		<i>Small Watch.</i>	<i>Large Watch.</i>		
October 29th	-	$\overset{a}{22.37.00}$			
Too fast	-	$8.23,2$			
Solar time	-	$22.28.36,8$	$\overset{b}{22.34.42}$	too fast	$- 6.05,2$
November 1st,	-	$\overset{b}{1.46.00}$			
Too fast	-	$0.16.54$			
Solar time	-	$1.29.06$	$1.35.57,5$	too fast	$- 6.51,5$

Therefore in 51 hours solar time the large watch gained  $46'',3$ .

*An Emerision of Jupiter's first Satellite.*

1st November, by watch emerged	-	-	<sup>h</sup> 7.27.20
At last observation, too fast	-	-	— 06.51,5
Gained afterwards at 46",3	-	-	— 05,3
			<hr/>
Emerision	-		7.20.23,2
Ephemeris	-		1.56.15
			<hr/>
Longitude in time	-		5.24.08,2
in degrees	-		81.02.03

The observations before written were made at the Chief's garden. The Fort flag was distant 2',5" in a frait line, and bore S. by. E. which give

difference of Longitude	-	-	+ ' 30
Latitude	-	-	— 2.28
Longitude of Gardens	-	81. 2.03	
			+ 30
			<hr/>
Longitude of Flag	-	81. 2.33	
Latitude of Gardens	-	16.10.32	
			— 2.28
			<hr/>
Latitude of the Flag	-	16.08.04	

*P E D D A P O O R E, 1784.*

*Observations by T. D. P.*

<i>♈ Serpentis</i> , on the meridian, June 18th	-	-	<sup>h</sup> 9.36.45
Do. 19th	-	-	9.28.57,5
			<hr/>
			7.47,5
Acceleration for the time	-		4 09,4
			<hr/>
Loss in one day	-		3.38,4

☉ On the meridian, June 18,  $\overset{b}{23.51.47.75}$ , flow -  $\overset{b}{8.12.25}$

*An Emerfion of Jupiter's first Satellite.*

The planet was extremely bright, and the Belts diftinct and clear; the glafs perfectly fteady.

19th June, by watch changed colour	-	-	$\overset{h}{15.16.22}$
Immerged	-	-	$15.18.38$
Too flow at noon	-	-	$+ 8.12.25$
Loss to obfervation at 219	-	-	$+ 2.21$
Immerfion	-	-	$15.29.11.25$
Ephemeris	-	-	$10.00.13$
Longitude in time	-	-	$5.28.58.25$
in degrees	-	-	$\overset{o}{82}.\overset{'}{14}.\overset{''}{34}$

From the obfervations at *Calcutta*, it appears that there is a difference between the longitudes derived from obfervations of immerfions and emerfions.

The mean of longitudes, 10 in number, derived from obfervations of immerfions, with an 18 inch reflector, was	-	-	$\overset{h}{5.53.53.77}$
Of emerfions (2) with the fame instrument	-	-	$5.53.43.4$
The fingle immerfion with <i>Dollond's</i> triple object glafs is	-	-	$5.53.57.8$
The mean of 4 emerfions with the fame	-	-	$5.53.3.9$
Difference by the reflector	-	-	$0.0.10.77$
By <i>Dollond's</i> refractor	-	-	$0.00.54.90$
The mean of all the immerfions (11)	-	-	$5.53.54.13$
Emerfions (6)	-	-	$5.53.17.4$
Difference	-	-	$36.73$
VOL. I.	N	As	

As the glass with which the observation was made differed from both, the difference derived from the whole is to be preferred, and so  $9'.25''$  are to be subtracted from this, to compare it with the other places, which were all emersions, and then the longitudes of *Peddapore* by emersions will be  $82^{\circ}.05'.19''$ .

*K O S S I M K O T T A*, 1782.

*Observations by T. D. P.*

9th October, double altitudes of *Jupiter* from the artificial horizon.

$7.47^{\circ} 00'$	—	$55.10.00''$		
48.36	—	54.28.50	Jupiter's R. A. at the time	— $17.32.06,7$
49.57	—	54.01.20	Declination do.	— S. $23.12.10$
50.58	—	53.37.10	☉ R. A. at do.	13.00.24,8
52.02	—	53.13.10	Latitude	— — $17.42.30$
53 05	—	52.50 00	Derived from the observed latitudes of <i>El-mulchillie</i> and <i>Sobaurum</i> .	
<hr/>				
7.50.16	Mean,	26.56.43	Apparent altitude.	
	—	1.51	Ref.	

---

26.54.52

From the above data the planet had passed the meridian		—	$3.16.37,3$
<i>Jupiter's</i> R. A.		—	$17.32.06,7$
			<hr/>
			20.48.44
☉ R. A.		—	$13.00.25$
			<hr/>
Time		—	7.48.19
Watch		—	7.50.16
			<hr/>
Too fast		—	1.57

The watch gained  $12''$  daily by the meridian of *Vizacpatam*.

*An*

*An Emersion of Jupiter's first Satellite.*

9th October, by clock emerged	-	-	<sup>h</sup> 7. <sup>m</sup> 11. <sup>s</sup> 45
Too fast at the observation	-	-	— 1.57
Emerfion	-	-	7.09.48
Ephemeris	-	-	1.38.00
Longitude in time	-	-	5.31.48
in degrees	-	-	82.57.00

*V I Z A C P A T A M, 1782.**Observations by T. D. P.**An Emersion of Jupiter's second Satellite.*

3d October, emerged	-	-	<sup>h</sup> 8.30.58
Ephemeris	-	-	2.57.20
Longitude	-	-	5.33.38
83°.24'.30".			

*An Immersion of Jupiter's third Satellite.*

7th October, immersion	-	-	<sup>h</sup> 8.9.57
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The time was shewn by Mr. RUSSELL's time-keeper, which was made by ARNOLD, and was regulated by the meridian line in his hall.

*7th September, an Emersion of Jupiter's first Satellite.**By T. D. P. 1784.*

7th September, by watch emerged	-	-	<sup>h</sup> 8.23.38
Sky remarkably clear and glass steady.	Full splendor	-	25 40

## Observations for time.

Observations for time.				Zenith Distance.
7th September, ☉ Ū. L.	$\overset{A}{22.22.25}$	} By arch of 90	-	$\overset{b}{41.29.20}$
	$24.48$		96	-
Latitude by 2 northern stars	} See observations at large			$\overset{0}{17.44.33.4}$
2 southern stars		under <i>Vizacpatam.</i>		$17.38.46.5$
N. B. Refraction + 50"		True Latitude	-	$17\ 41.45$
		Error of Collimation	-	$+ 02.58$
☉ Declination for the time and place	-	-	-	N. $5.30.39$
From the above data the time was	-	-	-	$\overset{b}{21.17.15.5}$
		By the watch	-	$20.23.36.5$
		The watch too slow	-	$53.39$
Day.		Middle Wire.		Upper Wire.
8th September, α <i>Aquilla</i> rising	-	$\overset{b}{7.01.13}$		$\overset{b}{7.03.16}$
	falling	- $8.07.35$		$8.05.30$
On the meridian	-	$7.34.24$		$\overset{b}{7.34.23.5}$
Passage by calculation	-	-		$8.29.55.5$
		Watch too slow	-	$55.32$

## 8th September, ☉ Zenith Distance.

			D. S.D. Non.	Zenith Distance.
☉ L.	<sup>b</sup> 19.13.55	} 90	_____	56.59.20
☉ U.	16.06	} 96	60.03.05	56.59.23
U.	16.49	} 90	_____	56.18.20
L.	19.00	} 96	60.00.07	56.18.04.6
U.	21.57	} 90	_____	55.05.00
L.	24.09	} 96	58.03.00	55.04.41.2
U.	25.18	} 90	_____	54.18.00
L.	27.28	} 96	57.03.20	54.17.12.7
<u>19.20.20</u>			Mean, -	55.40.00.3
☉ Declination				

☉ Declination	-	N. 5.09.42	
Latitude	-	17.41.45	
From the above data, time	-	20.17.30	
Watch	-	19.20.20	
Watch flow	-	57.10	
Therefore the watch lost in <sup>b</sup> 22.57	-	211.0	
And consequently daily	-	221.0	
<sup>D.ay.</sup> 8 at <sup>b</sup> 7.34.23.5	watch too flow	-	<sup>b</sup> 55.27.9
7 at <u>8.23.38</u>	the emerfion happened	-	<sup>k</sup> 0.55.32.0
Differēnce, 23.10.45.5	lofs in this time, at 221	-	— 3.33
	Therefore flow at emerfion	-	51.59
	Emerfion by watch	-	8.23.38
	Time of emerfion	-	9.15.37
	Ephemcris	-	3.42.56
	Longitude in time	-	5.32.41
	in degrees	-	<sup>o</sup> 83.10.15

*October 23d, an Observation of Jupiter's first Satellite, by Mr. MAXTON.*

The glafs the fame as mine; and the watch corrected by Mr. RUSSELL'S meridian line.

Emerfion by watch	-	<sup>k</sup> 10. 5.30
Watch faft	-	— 6.05
Emerfion	-	9.59.25
Ephemcris	-	4.26.08
Longitude in time	-	5.33.17
in degrees	-	<sup>o</sup> 83.19.15

This



This was the infant of first appearance, as well as Lieut. COLEBROOKE's, who observed the same at *Pizianagarum* palace.

Longitude by T. D. P.	-	83.10.15
by M.	-	83.19.15
		<hr/>
Mean	-	83.14.45

Mr. RUSSELL also made an observation, which I do not use, because he noted the time of full splendor, which is uncertain; it follows:

16th October, Watch fast at noon	-	<sup>b</sup> 1.43,5
gained daily	-	56",5
Add its gain to the observation	-	18,5
		<hr/>
Watch fast	-	2.02
Time of full splendor	-	8. 4.39
		<hr/>
Time of observation	-	8. 2.37
Ephemeris	-	2.29.17
		<hr/>
Longitude in time	-	5.33.20
in degrees	-	83.20.00

*B E E M U L W I L S A*, 1784.

*Observations by Lieutenant COLEBROOKE.*

☉ On meridian, August 7th	-	<sup>b</sup> 23.40.23,15
Equation of E. A.	-	+ ,60
		<hr/>
		23.40.23,75
	flow -	19.36,25
		☉ On

☉ On meridian, August 12th	-	$\overset{b}{23.22.30},5$	
Equation of E. A.	-	$+ 0,75$	
		<hr/>	
		$23.22.31,25$	flow - $\overset{'}{37.28},75$
			<hr/>
Loss in 5 days	-		$17.52,50$
Daily loss	-		$3.34,5$

*An Immersion of Jupiter's second Satellite.*

This was his first observation.

8th August, by watch immersed	, - -	$\overset{b}{12.33.20}$
Too slow at noon	- -	$19.36,25$
Loss to the observation, at $214'',5$	-	$1.55,2$
		<hr/>
Immersion	-	$12.54.51,45$
Ephemeris	-	$7.20.50$
		<hr/>
Longitude in time	-	$5.34.01,45$
in degrees	-	$\overset{0}{83.30.15},00$

*August 13th, by T. D. P.*

*Jupiter's* first satellite vanished by the watch - -  $\overset{b}{11.32.28}$   
 6 or 8 seconds before the time noted it had not changed colour: a cloud came on, and hid it for about 8 seconds, and when it was gone, the satellite had vanished.

*August 20th, by T. D. P.*

*Jupiter's* first satellite vanished by the watch -  $\overset{b}{14.2.30}$   
 The sky was clear, the glass steady: here I expected what happened, and was on my guard. The satellite vanished at a small distance from the body, *i. e.* before the contact, and without changing colour.

☉ On



*Observations by T. D. P.*

☉ On the meridian, September 2	-	<sup>A</sup> 23.20.47	
Equation of E. A.	-	+ 02,5	
		<hr/>	
		23.20.49,5	flow - 39.10,5
☉ Altitude, 5th September	-	<sup>h</sup> 21.53.55,5	<sup>h</sup> 67.31.35
Refraction and parallax	+	- 20	
Collimation	-	+ 51	
		<hr/>	
		67.32.06	
☉ Declination at the time and place	-	6.14.26	
Latitude	-	17.53.32	
From which data the time was	-	<sup>h</sup> 22.41.10,0	
By the watch	-	21.53.55,5	flow - 47.20,5
Whence the daily loss was	-	167",7	

*An Emersion of Jupiter's first Satellite.*

The sky clear of clouds, and the glass steady, but the vapours had a perceptible motion through the telescope. The belts were very distinct.

5th September, by watch emerged	-	-	<sup>h</sup> 14.00.35
N. B. Full splendor <sup>b</sup> 14.2.15.	Too slow at the altitude of the		
	☉ taken after the observation	-	+47.20,5
	Loss after the observation, at 167",7	-	<u>— 54,4</u>
	Emerfion	-	14.47.01,1
	Ephemeris	-	<u>9.13.36</u>
	Longitude in time	-	5.33.25,1
	in degrees	-	<sup>°</sup> 83 <sup>'</sup> 21.18

*Observations by Lieutenant COLEBROOKE.*

☉ On the meridian, September 29th	-	<sup>h</sup> 23.38.27,6	
Equation of E. A.	-	+ 5,4	
		<u>23.38.33,0</u>	flow - <sup>'</sup> 21.27,0
Equation of time	-	<u>23.49.46,4</u>	flow - 11.13,4
☉ On the meridian, October 1st	-	23.32.17,3	
Equation of E. A.	-	+ 5,7	
		<u>23.32.23,0</u>	flow - <sup>'</sup> 27.37,0
Equation of time	-	<u>23.49.08,6</u>	flow - 16.45,6
Daily loss on solar time	-	3'.05",1	

*An Emerſion of Jupiter's firſt Satellite.*

30th September, by watch emerged	-	-	<sup>h</sup> 9.15.10
Too ſlow at noon	-		+21.27
Loſs till obſervation, at 185",1	-		+ 1.15
			<hr/>
Emerſion	-		<sup>h</sup> 9.37.52
Ephemeris	-		4.05 02
			<hr/>
Longitude in time	-		5.32.50
in degrees	-		<sup>°</sup> 83. <sup>'</sup> 12 <sup>"</sup> 30

I ſuſpect that a miſtake was committed in writing down the time, and that it ought to have been <sup>h</sup>9.16.10. But this is as it is entered in the original book.

13th October, at 1'.48" ſet the watch forward one hour without ſtopping it.

☉ On the meridian, October 15th	-	<sup>h</sup> 23.51.53,5	
Equation of E. A.	-	+ 6,8	
		<hr/>	
		23.52.00,3	flow - <sup>'</sup> 7.59,7
Equation of time	-	23.45.31,7	faſt - 6.28,6

The obſervation of the ☉ paſſage over the meridian was not taken on the next day after the emerſion as uſual, and between the 17th and 18th the watch ran down, therefore the rate is aſcertained from the mean time, compared with the 29th September, and 1ſt October.

And the watch lost by the 1st	-	173,6 daily.
by the 2d	-	174,7
Mean	-	174,2
Daily variation	-	+11,5
Daily loss on solar time	-	185,7

*An Emersion of Jupiter's first Satellite.*

16th October, by watch emerged	-	-	<sup>b</sup> 7.53.35
Too slow at noon	-	-	+ 7.59,7
Loss till observation at 185'',7	-	-	+ 1.01,9
Emersion	-	-	8.02.36,6
Ephemeris	-	-	2.29.17,0
Longitude in time	-	-	5.33.19,6
in degrees	-	-	<sup>°</sup> 83.19.54

*Result of the Observation of Longitude.*

29th August, COLEBROOKE	-	83.25.16	83.25.16
5th September, PEARSE	-	83.21.18	83.21.18
30th do. COLLBROOKE	-	82.12.30	rejected.
16th October, COLEBROOKE	-	83.19.54	83.19.54
Mean	-	83.19.44,5	83.22.09,3

*VIZIANAGARUM PALACE.*

*An Observation of Jupiter's second Satellite, by T. D. P.*

22d October, by watch emerged	-	-	<sup>b</sup> 7.16.06
Full splendor	-	-	18.18

*Observations*

*Observations by Lieutenant COLEBROOKE.*

		<i>Equal Altitudes.</i>	
* <i>Fumulhoot</i> rising	-	<sup><i>b</i></sup> 7.48.10	
falling	-	9.44.25	
		<hr/>	
* On the meridian	-	8.46.17,5	
By calculation	-	8.54.35,5	flow - 8.18
		<hr/>	
☉ On the meridian, 22d	-	<sup><i>b</i></sup> 23.50.14,5	
Equation of E. A.	-	+ 7,0	
		<hr/>	
		23 50.21,5	flow - 9.38,5
		<hr/>	
23d October, * <i>Fumulhoot</i> rising	-	<sup><i>b</i></sup> 7.51.39	
falling	-	9.29.05	
		<hr/>	
* On the meridian	-	8.40.22	
By calculation	-	8.50.46,2	flow - 10.24,2
		<hr/>	
☉ On the meridian, 23d	-	<sup><i>b</i></sup> 23.48.10,3	
Equation of E. A.	-	+ 7,6	
		<hr/>	
		23.48.17,3	flow - 11.42,7
From the above, daily loss	-	125'',2	

*An Emersion of Jupiter's first Satellite.*

By watch emerged	-	-	-	<sup><i>b</i></sup> 9.48.55
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22d October, <i>Jupiter's</i> second Satellite emerged	-	<sup>a</sup> 7.16 06
By <i>Fumulhoot</i> , watch flow	- -	+ 8.18
Loss in <sup>b</sup> 1.30 after emerfion, at 12 <sup>h</sup> 5,2	-	— 07,8
Emerfion	-	7.24.16,2
Ephemeris	-	1.49.57
Longitude in time	-	5.34.19,2
in degrees	-	83° 34' 48,0
23d October, <i>Jupiter's</i> first Satellite emerged	-	<sup>b</sup> 9.48.55
By <i>Fumulhoot</i> too flow	- -	+ 10.24,6
Loss in <sup>b</sup> 1.8 after <i>Fumulhoot</i> paffed at 12 <sup>h</sup> 5,2	-	+ 06,0
Emerfion	-	9.59.25,6
Ephemeris	-	4.26 08,0
Longitude in time	-	5.33.17,6
in degrees	-	83° 19' 54,0

Mr. MAXTON observed this at *Vizacpatam*, and the two observations shew only 39" difference of longitude; but the high hill that lies to the north of the palace bore from *Beemulwilsa*, N. 8°.25' E. and by trigonometry its distance was 22,978 miles; therefore it lay north of *Beemulwilsa* 19'.28" and east 2' 52". The palace lies 12'.20",3 to the north by observations at large, and therefore to the east 1'.48". But *Beemulwilsa* lies to the east of *Vizacpatam*. Mr. MAXTON's eye, it may be presumed, is not so quick as Lieutenant COLEBROOKE's, and will suffice to account for the difference;

difference; for, by a particular survey round these parts, *Vizianagur* fort does lie 6'.36" east of *Vizacpalam*.

### N A R R A I N P O O R.

Which, by the table of the route, lies west of *Vizianagarum* palace 2'.

*Observations by Lieutenant COLEBROOKE for Time.*

○ On the meridian October 31st	-	<sup>b</sup> 23.36.04,3		
Equation	-	+ 6,4		
		<hr/>		
		23.36.10,7	flow	- 23 49,3
		<hr/>		
November 1st	-	23 34.39,5		
Equation	-	+ 6,8		
		<hr/>		
		23.34.46,3	flow	- 25.13,7
				<hr/>
		Daily loss	-	1.24,4

### *An Observation of Jupiter's first Satellite.*

Sky remarkably clear, and glass steady.

31st October, emerged by watch	-	-	<sup>b</sup> 6.06.45
Too slow at noon	-	-	23.49,3
Loss till observation at 84",4	-	-	22,5
			<hr/>
Emerison	-		6.24.56,8
Ephemeris	-		51.26
			<hr/>
Longitude in time	-		5.33.30,8
in degrees	-		83.22.42,0

KALINGA.

*KALINGAPATAM, 1784.**Observations by Lieutenant COLEBROOKE for Time.*

☉ On meridian, November 7th	-	<sup>b</sup> 23.50.56,5			
Equation of E. A.	-	+ 6,8			
		<hr/>			
		23.51.03,3	flow	-	- 8.56,7
☿ Calliopææ on the meridian	-	8.49.48			
By calculation	-	9.00.01,6	flow	-	- 10.13,6

Therefore the watch lost 1'.16'',9 in 9 hours, and 205'',06 daily.

N. B. The watch had run down on the 5th, and the weather was changing from dry to cloudy, which ended in rain.

*For Longitude.**An Emersion of Jupiter's first Satellite.*

Glass steady, atmosphere rather thick

By watch emerged	-	-	-	<sup>h</sup> 8.13.35
Too flow by the star	-	-	-	+10.13,6
The star passed after the emersion 36'; loss for that time	-	-	-	<hr/> 5,1
Emersion	-	-	-	8.23.43,5
Ephemeris	-	-	-	<hr/> 2.47.01,0
Longitude in time	-	-	-	5.36.42,5
in degrees	-	-	-	<sup>°</sup> 84.10.37,5

*IECHAPOORE,*

## I E C H A P O O R E, 1782.

Observations by T. D. P.

Double altitudes of *Jupiter*, with the octant and artificial horizon.

<i>Times.</i>		<i>Angles.</i>		
<sup>h</sup> 8.10.03	—	<sup>h</sup> 64.28.10	<i>Jupiter's</i> R. A. at the time	- <sup>h</sup> 17.21.46,6
13.03	—	63.30.00	Declination	- <sup>h</sup> 23.02.04 S.
15.08	—	62.45.20	☉ R. A. at the time	- <sup>h</sup> 11.55.08,2
18.53	—	61.50.30	Latitude by COLEBROOKE	1784, see Table.
8.14.17	Mean	31.34.15	See observations at large	- <sup>h</sup> 19.06.45
	Ref.	- 1.34		
		31.32.41		

From the above data, <i>Jupiter</i> had passed the meridian	<sup>h</sup> 2.45.59,2, and
the time was	- - <sup>h</sup> 8.12.37,6
Watch	- <sup>h</sup> 8.14.17
Too fast	- 1.39,4

*An Eclipse of the Moon.*

21st September	- <sup>h</sup> 7.00.15	doubtful.
	01.40	begun certainly.
	02.40	strong shadow came on.
	04.14	Penumbra touched a place which I name A.
	09.03	shadow touched A.
	9.06.56	shadow touched the limb at B.
	08.11	Penumbra going.
	10.12	limb not perfectly bright.
	11.20	end certainly, and at B.

By comparison of the observations at A, it appears that the shadow required 4'.49" to move through the breadth of the penumbra. By comparing those at B, it appears that 4'.24" were then sufficient.

The mean of these will be very near the truth; it is 4'.37".

Shadow came on	-	-	<sup>h</sup> 7.02.40
Advance of penumbra	-	-	04.37
Beginning of eclipse	-	-	<hr/> 6.58.03
Shadow touched the limb	-	-	9.06.56
Retreat of penumbra	-	-	<hr/> +04.37
End of eclipse	-	-	<hr/> 9.11.33
Duration observed	-	-	<hr/> 2.13.30
Duration by ephemeris	-	-	<hr/> 2.08.30
			<hr/> +05.00
By ephemeris end	-	-	3.28
Beginning	-	-	<hr/> 1.19.30
Duration	-	-	<hr/> 2.08.30
Ephemeris middle	-	-	<hr/> 2 23.45
Middle observed by watch	-	-	<hr/> 8.04.48
Too fast	-	-	<hr/> 1.39.4
			<hr/> 8.03.08,6
Ephemeris	-	-	<hr/> 2.23 45
Longitude in time	-	-	<hr/> 5.39.23,6
in degrees	-	-	<sup>°</sup> 84.50.54
	*		<i>G A N J A M</i>

## GANJAM FORT, 1782.

*Observations by T. D. P. Latitude determined.*

4th September, horizon clear, octant	-	-	<sup>b</sup> 19.21.30
6th, Very hazy, by sextant, and quadrant, both agreed	-	-	19.21.03
16th	Sextant	-	19.21.50
	Octant	-	19.19.50
	Mean	-	<hr/> 19.21.03

These were taken from the top of the Chief's house, the sea was the horizon; the height above the area of the fort was measured, but the height of that area was guessed at; the dip was taken corresponding to this height from the tables.

*An Observation of Jupiter's fourth Satellite.*

16th September 1782, immersion	-	-	-	<sup>b</sup> 6.45.27
The change of colour was noted at	-	-	-	6.44.04

Clouds prevented the observing of the emergence of this, and the immersion of the first, which happened that night.

## GANJAM CAMP, 1784.

*Observations by Lieutenant COLEBROOKE.*

☉ On the meridian, November 20th	-	<sup>h</sup> 23.57.36.3
Equation of E. A.	-	+ 05.5
		<hr/> 23.57.41.8
	flow	- <sup>'</sup> 2.18.2

☉ On the meridian, 21st	-	$\overset{b}{23.56.00}$		
Equation of E. A.	-	$+05,5$		
		<hr/>		
		23.56.05,5	flow	- $\overset{'}{3} \overset{''}{54,5}$
☉ On the meridian, 22d	-	$23.54.15,0$		
Equation of E. A.	-	$05,4$		
		<hr/>		
		23.54.20,4	flow	- 5.59,6

\* *Cassiopeiæ*, 24th November.

	<i>First Wire.</i>	<i>Middle.</i>	<i>Upper.</i>	
Rising	$\overset{b}{7.28.20}$	$34.40$	$42.40$	
Falling	$9.35.53$	$29.35$	$21.37$	
	<hr/>	<hr/>	<hr/>	
On the meridian	- $8.32.06,5$	$32.07,5$	$32.08,5$	$\overset{b}{8.32.07,5}$
		By calculation	-	$\overset{b}{8.39.51,2}$
				<hr/>
		Slow	-	7.43,7

Which compared with the last solar observation, gives  $91'',3$  daily loss.

*An Emerision of Jupiter's first Satellite.*

24th November, by watch emerged	-	-	-	$\overset{b}{6.37.35}$
Too slow by the star	-	-	-	$+7.43,7$
Loss after the emerision, at $91'',3$ ,			-	$7,3$
				<hr/>
Emerision	-			$6.45.11,4$
Ephemeris	-			$1.04.39$
				<hr/>
Longitude in time	-			$5.40.32,4$
				<hr/>
in degrees				$\overset{0}{86.08.06}$

*JEHAUDJEPOOR,*

## JEHAUDJEPOOR, 1784.

*Observations by Lieutenant COLEBROOKE.*

	<i>Middle.</i>	<i>Upper.</i>
17th December, * $\epsilon$ Cassiopææ rising	$\overset{h}{6.31.40}$	$42,03$
falling	$8.05.53$	$55,31$
* On the meridian	$7.18.46,5$	$18,47 = \overset{b}{7.18.46,7}$
By calculation	-	$7.54.48,7$
Watch flow	-	$36.02,0$
☉ On the meridian, 17th	$\overset{b}{23.23.59,3}$	
Equation of E. A.	$+1$	
	$23.24,00$	flow - $36.00$

*An Emersion of Jupiter's first Satellite.*

By watch emerged	-	$\overset{b}{6.21.25}$
Too slow by the *	-	$36.02$
Emersion	-	$6.57.27$
Ephemeris	-	$1.11.50$
Longitude in time	-	$5.45.37$
in degrees	-	$86.24.15$

SOOBUNREEKA



## SOOBUNREEKA RIVER CAMP, 1784.

Observations by Lieutenant COLEBROOKE.

*N. B. Opposite Jellalore, on the Ballalore side of the river.*

☉ On the meridian, December 24th	-	<sup>b</sup> 23.19.34,1	
Equation of E. A.	-	— 7	
		<hr/>	
		23.19.33,4	flow - 40.26,6
☉ On the meridian, December 25th	-	<sup>b</sup> 23.18.12	
Equation of E. A.	-	— 1	
		<hr/>	
		23.18.11	flow - 41.49,0
Daily loss	-	82",4	

*An Emersion of Jupiter's first Satellite.*

17th December, by watch emerged	-	-	<sup>b</sup> 8.12.42
Full splendor.	Too flow at the following noon	-	40.26,2
<sup>b</sup> 8.13.50	Loss after emersion, at 82,4	-	— 52
			<hr/>
	Emersion	-	8.52.16,2
	Ephemeris	-	3.04.14
			<hr/>
	Longitude in time	-	5.48.02,2
	in degrees	-	87.00.33,0

*Ans*

*An Emerſion of Jupiter's ſecond Satellite.*

25th December, by watch emerged	-	-	<sup>b</sup> 6.04.40
Watch flow	-		+40.26,6
Loſs till obſervation, at 82'',4	-		+ 23,2
Emerſion	-		6.45.29,8
Ephemeris	-		— 55.57
Longitude in time	-		5.49.32,8
in degrees	-		87.23.12

*A Comparison of the Obſervations for Longitudes with correſponding Obſervations at different Places, to fix the Longitudes of thoſe which were undetermined.*

By T. D. PEARSE.

*C A L C U T T A.*

The obſervatory was at the Treafury Gate in *Fort William*.

*Lunar Eclipses.*

1776, July 30th, Immerſion at <i>Calcutta</i>	-	<sup>b</sup> 17.01.16	
<i>Greenwich</i>	-	11 08.21	<sup>b</sup> , ,
As this was not of the beſt, I reject it.			5.52.55

1779, November 23d, I reject the beginning, becauſe when compared with *Tycho* in the former part, it appears, from a like compariſon of the *Greenwich* obſervations, that it is erroneous a full minute. The ſiſt Copernicus



Date.	Place.	Time.	Correction for Longitude or Glafs.	Times correct.	LONGITUDE.	
					In Time.	In Degrees.
1774, October 14th,	Calcutta, Stockholm,	$\begin{matrix} h \\ 12.32.25 \\ 07.52.00 \end{matrix}$	$\begin{matrix} h \\ 1^{\text{st}} \text{ Sat. Im. } + 24 \\ - 1.12.21 \end{matrix}$	$\begin{matrix} h \\ 12.32.49 \\ 6.39.39 \end{matrix}$	$\begin{matrix} b \\ " \\ " \end{matrix}$	$\begin{matrix} " \\ " \\ " \end{matrix}$
21 <sup>st</sup> .	Greenwich, Paris, Geneva, Oxford,	$\begin{matrix} " \\ 8.44.47 \\ 8.59.40 \\ 8.30.26 \end{matrix}$	$\begin{matrix} " \\ 1^{\text{st}} \text{ Sat. Im. } \\ - 09.25 \\ - 24.05 \\ + 4.59 \end{matrix}$	$\begin{matrix} " \\ 8.35.00 \\ 22 \\ 15 \\ 25 \end{matrix}$	5 53 10.0	
		Immersion.	Mean, Add one Revolution 1, Day 23d,	$\begin{matrix} " \\ 8.35.15.5 \\ 18.28.49 \end{matrix}$		
23 <sup>d</sup> .	Calcutta,	8.57.15	$\begin{matrix} " \\ 1^{\text{st}} \text{ Sat. Im. } + 24 \end{matrix}$	$\begin{matrix} " \\ 3.04.45 \\ 8.57.39 \end{matrix}$	5 53 34.5	
December 31 <sup>st</sup> .	Calcutta, London,	$\begin{matrix} " \\ 11.25.47 \\ 6.25.05 \end{matrix}$	$\begin{matrix} " \\ - 24 \text{ Em. } \\ - 52.55 \end{matrix}$	$\begin{matrix} " \\ 11.25.23 \\ 5.32.10 \end{matrix}$	5 53 13.0	
1776, November 11 <sup>th</sup> .	Greenwich,	$\begin{matrix} " \\ 1^{\text{st}} \text{ Sat. Im. } \end{matrix}$	$\begin{matrix} " \\ \text{N. B. Refractor, } \\ \text{Add one Revolution 1, } \\ \text{Day, 13th,} \end{matrix}$	$\begin{matrix} " \\ 13.37.32 \\ 18.28.06 \end{matrix}$		
13 <sup>th</sup> .	Calcutta,	13.58.56.3	$\begin{matrix} " \\ 1^{\text{st}} \text{ Sat. Im. } + 12 \end{matrix}$	$\begin{matrix} " \\ 8.05.38 \\ 13.59.08.3 \end{matrix}$	5 53 30.3	
17 <sup>th</sup> .	Calcutta, Chisichurst,	$\begin{matrix} " \\ 15.31.51.3 \\ 9.38.48.5 \end{matrix}$	$\begin{matrix} " \\ 3^{\text{d}} \text{ Sat. Im. } + 12 \\ - 19 \end{matrix}$	$\begin{matrix} " \\ 15.32.03.3 \\ 9.38.29.5 \end{matrix}$	5 53 33.8	
December 18 <sup>th</sup> .	Calcutta, Marfeilles,	$\begin{matrix} " \\ 15.58.21 \\ 10.25.54 \end{matrix}$	$\begin{matrix} " \\ 2^{\text{d}} \text{ Sat. Im. } \\ - 21.25 \end{matrix}$	$\begin{matrix} " \\ 15.58.21 \\ 10.04.29 \end{matrix}$	5 53 52.0	
			Mean by Jupiter's Satellite,	-	5 53 29	
			By Lunar Eclipses,	-	5 53 28	
			Result—Longitude of Calcutta.	-	5 53 28.5	88.22.07.5

Date.	Place.	Time.	Correction for Longitude or Glafs.	Times correct.	LONGITUDE.	
					In Time.	In Degrees.
1782, September 21 <sup>st</sup> .	Ichapoores,	A LUNAR ECLIPSE. The shadow touched the limb.		$b$	$b$	$0^{\circ}$
	Nagpoore,	$8.44.22$	$-5.18.46$	$3.25.36$		
	JUPITER'S SATELLITES.					
October 9 <sup>th</sup> .	Koffim Kotta,	1 <sup>st</sup> Sat. E.		$7.09.48$	$5.39.40.6$	$84.55.09.0$
	Nagpoore,	$6.56.43$	$-5.18.46$	$1.37.57$		
1784, September 5 <sup>th</sup> .	York,	$9.08.54$	$+ 4.31$	$9.13.25$	$5.31.51.0$	$82.57.45$
	Greenwich,		Refractor,	$15$		
			$\{ + \text{ glafs, } 13$			
	Paris,	$9.22.18$	$\{ - 9.25$	$06$		
	Beemulwiffa,	$14.47.01.1$	1 <sup>st</sup> Sat. E. Mean,		$9.13.15.5$	
			$- 12$	$14.46.49.1$	$5.33.34.0$	$83.23.30.0$
November 8 <sup>th</sup> .	Kalingapatam,		1 <sup>st</sup> Sat. E.	$8.23.43.5$		
	Chunargur,	$8.19.45$	$-5.32.26$	$2.47.09$	$5.36.34.5$	$84.08.37.0$

## OBSERVATIONS at large for determining the Latitudes of PLACES.

Phænomenon and Face of the Quadrant.	Date.	ARCH OF 96. Reading.	Value.	Arch of 90.	Refraction or E. quation applied.	Zenith Dif. tance corrected.	Declination.	Latitude by the observation.	Name of the place and its correct Latitude.
$\alpha$ Aquilæ, E.	1783. Oct. 9th.	D.S.D.N. 4. 3.28.3	0 4.39.36.2	0 4.40.00	4.3	0 4.39.52.4	8.18.24.7N.	12.58.17.1	Viperee.
W.	11th.	6-3.01.5	4.54.39.2	4.55.00	5	4.54.54.2		13.13.18.9	
E.	12th.	4. 3.28	4.39.29.6	4.40.00	4.3	4.39.49.1		12.58.13.8	
$\alpha$ Cygni, W.	9th.	33. 1.20.5	31.19.19.3	31.19.10	35.3	31.19.50	44.30.53.8N.	13.11.03.8	
W.	11th.	33. 1.18.5	31.18.26.5	31.18.30	35.3	31.19.03.6		13.04.50.2	
Fumuloort, E.	11th.	46. 2.18	43.43.32	43.44.00	54.5	43.44.40.5	30.45.43 S.	12.58.57.5	
$\alpha$ Pegasi, E.	11th.	2-3.12	1. 5.02.4	1. 5.00	1	1. 5.02.2	14. 2.42.8N.	12.57.40.6	
W.	11th.	0. 3.21	0.51.11.3	0.51.30.0	0.8	0.51.21.5		13.11.21.5	Viperee,
4 Stars, E.								12.58.17.2	
4 Stars, W.								13.11.53.5	13.05.05.35
Algenib, E.	Nov. 1. 0.00	0.56.15	0.57.00	0.9	0.56.38.4	13.58.34.7N.		13. 1.56.1	Trivatore,
W.	21st.	0. 3.00	0.42.11.3	0.42.30	0.7	0.42.21.3		13.16.13.3	
Pole at 10 P.	79. 3.16	74.53.18	74.53.30	210.0	75 00.1.2.2	88. 9.08		13.08.55.8	13. 9.00.4
				Collim.	428.0				
$\alpha$ Leonis, E	1784. April 23d.	0. 1.04	0.15.49.2	0.15.55	228.0	0.15.55.3	13.00.53 N	13.16.45	North side of Corclare river,
$\alpha$ Urf.Maj.W.	52. 3.29	49.39.56	49.40.40	67.0	49.41.25	62.54.43 N	13.13.18	13.15.01.5	
$\alpha$ Leonis, W.	25th.	0. 2.09	0.32.05	0.32.40	0.5	0.30.43	13 00.53 N.	13.31.34	Arambaukum,
				Collim.	102			13.31.36	
$\alpha$ Urf.Maj.W.	26th.	52. 1.29	49.11.48.4	49.12.20	67.0	49.13.11.2	62.54.43 N.	13.41.32.2	Akamapett,
$\alpha$ Virginis, E.	25. 1.01	23.40.45	23.41.00	25	23.41.17.5	10. 1.46 S.	13.39.31.5	13.40.32	
$\alpha$ Leonis, W.	27th.	0. 3.10.5	0.46.48	0.47.00	0.8	0.46.54.8	13. 0.53 N.	13.47.47.8	Akarumpauk,
$\gamma$ Leonis, W.	7. 2.14	7. 8.01.6	7. 7.20	7	7. 7.48.8	20.55.38 N.	13.47.50	13.47.49	
$\gamma$ Leonis, W	28th.	7. 1.20	6.56.36	6.57. 0	7	6.56.55	13.40.43	13.40.43	Nayrpett,
$\alpha$ Virginis, E.	25.20.01	23.54.49	23.55.00	25	23.55.19	10. 1.46 S.	13.53.33	13.56.08	
$\alpha$ Urf.Maj.W.	29th.	52. 0.12.5	48.50.29.6	48.50.50	65	48.51.45	62.54.43 N	14. 2.58	Korware,
$\alpha$ Virginis, E.	25. 2.25	24. 5.22	24. 5.50	25	24. 6.01	10. 1.46 S.	14. 4.15	0 .	
$\gamma$ Leonis, W.	30th.	7. 1. 3	6.49.07.2	6.49.10	6.5	6.49.15	20.55.38 N	14. 6.23	14. 5.12.6
$\alpha$ Urf.Maj.W.	25. 0. 9	48.48.57	48.49.40	65	48.50.23	52.54.43 N.	14. 4.20		
$\alpha$ Virginis, E.	25. 2.23	24. 4.29	24. 5.10	25	24. 5.15	10. 1.46 S.	14. 3.29		Vincateechil-
$\alpha$ Urf.Maj.W	May 51. 3.04	48.32.42	48.32.00	64	48.33.25	62.54.43 N.	14.21.18		lum, .
$\alpha$ Virginis, E.	1st.	25. 3.26	24.19.52	24.20.00	26	24.20.22	10. 1.46	14.18.36	14.19.57

## OBSERVATIONS at large for determining the Latitudes of PLACES.

Phorus semina and Fix of the Quadrant.	Date.	ARCH OF 96.		Arch of 90.	Equa- tion ap- plied.	Zenith Dif- ference cor- rected.	Declination.	Latitude by the observ- ation.	Name of the place and its correct Latitude.
		Reading.	Value.						
	1784	D S D. N.							
♂ Urf. Maj. W.	May 46.	2.17	43.43.06	43.44.00	54	43.44.27	58.13.58 N.	14.29.31	Pinnare River.
♂ Urf. Maj. W.	3d.	4+ 1.10	41.43.27.4	41.33.10	50.3	41.31.09	56. 3.23 N.	14.29.14	North Bank,
α Virginis, E.	26.	0.15	24.29.05.5	24.29.10	26	24.29.33.7	10. 1.46 S	14.27.47.7	14.28.35
α Virginis, E.	10th.	26. 2.22	25.00.17.6	25.00.40	26.2	25.00.55		14.59.09	Offore*,
♂ Urf. Maj. W.	4+ 1.20		41.37.51	41.37.20	49	41.38.24.5	56. 3.23 N.	14.24.58.5	14.2.03.8
♂ Urf. Maj. W.	12th.	46. 0.22	43.17.10	43.17.10	53	43.18.03	58.13.58 N.	14.55.55	Mooamullio-
α Virginis, E.	26. 1.28		24.48.52	24.48.50	25	24.49.16	10 1.48 S	14.47.28	dooro,
♂ Urf. Maj. W.	43. 3.15		41. 7.32	41. 8.10	44	41. 8.35	56. 3.23 N.	14.54.48	
α Virginis, E.	13th.	26. 1.30	24.49.43.5	24.50.00	25	24.50.19.3	10. 1.48 S.	14.48.31.3	0. 1.42.1
♂ Urf. Maj. W.	43. 3.14		41. 7.05.5	41. 7.10	44	41. 7.51.7	56. 3.23 N.	14.55.31.3	14.51.42.1
♂ Urf. Maj. W.	19th.	45. 2.07	42.42.27.1	42.42.10	53	42.43.11.5	58.13.58 N.	15.30.46.5	Ungle, properly
♂ Urf. Maj. W.	4+ 1.17		41.36.32	41.36.00	50	41.37.06	57. 8.02.5 N.	15.30.56.5	Wungole,
α Virginis, E.	27. 0.22		25.28.25	25.29.00	27	25.29.09.5	10. 1.48 S	15.27.21.5	15.29.18.2
♂ Urf. Maj. W.	43. 0.27		40.30.37	40.30.30	49	40.31.22.5	56. 3.23 N.	15.32.00.5	Chicoortee,
α Virginis, E.	20th.	27. 1.05	25.35.01	25.35.00	27	25.35.27.5	10. 1.48 S.	15.33.39.5	15.35.44.5
♂ Urf. Maj. W.	43. 0.17		40.26.13	40.26.05	49	40.26.58	56. 3.23 N.	15.36.25	Yenmunbender,
α Virginis, E.	22d.	27. 1.05	25.35.01	25.35.00	27	25.35.27.5	10. 1.48 S.	15.33.39.5	
♂ Urf. Maj. W.	43. 0.13		40.24.29	40.25.00	49	40.25.33.4	56. 3.23 N.	15.37.49.6	15.46.27.5
♂ Urf. Maj. W.	23d.	36. 3.15	34.33.37	34.33.50	39	34.34.22.5	50.23.42 N.	15.49.09	Vantipollam,
α Libræ, E.	32. 3.21		30.51.25	30.51.05	34	30.51.49	15. 8.07 S.	15.43.46	15.46.27.5
α Virginis, E.	25th.	27. 2.15	25.53.28	25.54.00	28	25.54.12	10. 1.48 S.	15.52.24	Baupetla,
♂ Urf. Maj. W.	42. 3. 3		40. 6.00	40. 5.50	48	40. 6.43	56. 3.23 N.	15.56.40	15.54.32
LIEUTENANT COLEBROOK had by this time acquired the art of using the quadrant, and his observations will appear where I did not take any. The next is his, and where his are substituted, they will be marked C. He did observe Chicoortee, the result I had entered in my book, it was 15°.34'.10" but his observation was lost.									
♂ Urf. Maj. W.	26th.	36. 2.16	34.20.09.4	34.20.00	39	34.20.43.7	50.23.42 N.	16.02.58.3	Chundole,
α Libræ, E.	33. 0.20		31. 5.02	31. 5.00	34	31. 5.35	15. 8.03 S.	15.57.32	16. 0.15.2 C.
♂ Urf. Maj. W.	28th.	36. 1.22	34. 8.44	35. 8.05	38	34. 9.02.5	50.23.42 N.	16.14.39.5	Sicacollum, on the North Bank of the Kistna,
α Libræ, E.	33. 1.15		31.16.54	31.17.00	34	31.17.31	15. 8.03 S.	16. 9.28	16.12.04.3

\* The quadrant was pulled to pieces at Pinnare Camp, and the line of collimation had not been adjusted; it was performed before it was next used.

## OBSERVATIONS at large for determining the Latitudes of PLACES.

Phenomenon and Face of the Quadrant.	Date.	ARCH OF 96. Reading.	Value.	Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the observation.	Name of the place and its correct Latitude.
♄ Urf. Maj. W.	1784, May 29th.	D.S.D.N. 43. 1.16	0 40.40.43	0 40.39.55	49	40.41.08	57. 8.02.5N	16.26.54.5	Moodenoore,
♌ Virginis, E.		28. 0.21	26.24.14	26.23.30	29	26.24.21	10. 1.48 S.	16.22.33	16.24.38.8 C.
♌ Virginis, E.	June 1st.	28. 1.78	26.41.22	26.42.00	29	26.42.10		16.40.22	Ellore,
♄ Urf. Maj. W.		41. 3.22	39 18.16	39.18.10	48	39.19.10	56. 3.25 N.	16.44.13	16.42.17.5 P.
♄ Urf. Maj. W.		43. 0.03	40.22 15.9	40 22.20	49	40.23.07	57. 8.02.5N	16.44.55.5	
♄ Urf. Maj. W.		35. 3.17	33.38.24.5	33.38.40	37.7	33.39.10	50.23.42 N.	16.44.32	
♌ Libræ, E.		33. 3.22	31.48.06.3	31.48.10	35	31.48.43.2	15. 8.04 S.	16.40.39.2	16.42.41.5 C.
☉ Up. L. W.	4th.	5. 2.20	5.18.10	5.18.40	50	5.34.18	22.32.32 N	16.58.14.5	Soolaurum,
				Semedia.	+ 15.49				
				Parallax.	1.0				
♌ Virginis, E.		28. 2.28	26.55.26	26.55.20	29	26.55.52	10. 1.48 S.	16.54.04.0	16.56.08.5
♌ Virginis, E.	12th.	28. 3.02	26.58.04	26.57.05	29	26.58.03.5		16.56.15.5	Rajahmundry,
♄ Urf. Maj. W.		41. 2.15.5	39. 1.11.2	39. 1.20	46	39. 2.01.6	56. 3.23 N.	17. 1.12.4	16.58.43.6 P.
♄ Urf. Maj. W.	12th.	35. 2.09	33.20.50	33.21.00	36	33.21.31	50.23.42 N.	17. 2.11	
♌ Libræ, E.		34. 0.23	32. 2.44	32. 2.40	35	32. 3.17	15. 8.04 S.	16.55.13	16.58.42 C.
♄ Urf. Maj. W.	13th.	35. 1.29	33.15.33	33.15.00	35.5	33.15.58	50.23.42 N.	17. 7.50	Rajahnagur,
♌ Libræ, E.		27. 1.07	25.35.53	25.35.00	27	25.35.53	8.34.33 S.	17. 1.20	7. 4.35 C.
♄ Urf. Maj. W.	14th.	35. 1.29	33.15.33.5	33.15.55	37	33.16.21	50.23.42 N.	17. 7.21	Peddapore,
♌ Draconis, W.		51. 2.00	48.16 52.5	48.16.10	62.7	48.17.34	65.24.36 N.	17. 7.02	
♌ Libræ, E.		34. 1.18	32.10.05	32. 9.30	34.5	32.10.22	15. 8.04 S.	17. 2.18	
♌ Libræ, E.		27. 1.07	25.35.53.3	25.34.40	25.4	25.36.12	8.34.33 S.	17. 1.39	17. 4.35 P.
♌ Scorpii, E.	18th.	38. 2.20	30 14.25	26.13.40	41.5	30.14.44	19.12.01.6 S.	17. 2.42	
♌ Draconis, W.		36. 2.24	34.23.40	34.24.00	39.0	34.24.29	51.31.18 N	17. 6.49	17. 4.45.5 C.
♌ Virginis, E.	20th.	28. 3.27	27. 8.59.7	27. 8.30	29.0	27. 9.13.7	10. 1.48 S.	17. 7.26	Gooloopol-loore,
♌ Libræ, E.		27. 1.19	25.41.09.7	25.41.30	28.0	25.41.48	8.34.33 S.	17. 7.15	
♄ Urf. Maj. W.		41. 1.30	38.53.30	38.53.20	44.0	38.54.09	56. 3.33 N.	17. 9.05	
♄ Urf. Maj. W.		35. 1.23	33.12.55.2	33.12.50	37	33.13.15	50.23.42 N.	17.10.27	17. 8.33.5 C.
♄ Urf. Maj. W.	21st.	35. 1.16	33. 9.50.6	33. 9.20	37	33.10.12	50.23.42 N.	17.13.30	Tonding and Matour,
♌ Libræ, E.		34. 1.39	32.19.18	32.20.00	35	32.20.14	58.18.04 S.	17.12.10	17.12.45 C.
♌ Libræ, E.	22d.	27. 2.10	25.51.16	25.50.20	28	25.53.06	8.34.33 S.	17.18.33	Sutcaaurum,
					+ 1.50				
			From 18th to 20th June		10				
♌ Coronæ Bo- realis, W.	24th.	10. 2.02	9.51.30	9.50.40	10	9.51.15	27.27.03.5N.	17.35.48.5	17.18.33 C.
♌ Scorpii, E.		39. 0.19	36.42.06	36.41.50	43	36.42.41	19.12.01.6 S.	17.30.39.4	17.33.14 C.

## OBSERVATIONS at large for determining the Latitudes of PLACES.

Phænomenon and Face of the Quadrant	Date.	ARCH OF 96.	Value.	Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the place and its correct Latitude.
$\alpha$ Coronæ Borealis, W.	1784 June 27th	D.S.D.N. 10. 1.08	9.40.04.7	9.39.40	9.6	9.40.02	27.27.03.5N	17.47.01.5	Nobaurum,
$\beta$ Scorpii, E.	9th July	39. 1.23.5	36.58.0.14	36.57.20	43	36.58.27.2	19.12.02 S	17.46.25.2	17.46.59.2 C.
$\alpha$ Scorpii, E.	12th July	46. 2.11	43.40.27.6	43.41.00	55 +	43.41.39	25.56.12 S.	17.45.27	These were made with difficulty amongst clouds and winds, but they were all that could be had.
$\odot$ Up. L. W.		5.04.12	3.50.86.4	3.50.00	3.6 +	4 5.59	27.55.02 N.	17.49.03	
$\alpha$ Lyrae, W.	Sept. 22.00.29	20.50.14	20.40.40	20.40.40	15 47	20.50.30	38.35.26.3N.	17.44.56.3	Vizacpatam,
$\beta$ Lyrae, W.	8th July	16.01.20	15.22.51	15.22.10	15	15.22.45.5	38.07.16 N.	17.44.30.5	
$\alpha$ Aquilæ, E.	9.03.27	9.20.18.2	9.20.00	9.20.00	9	9.20.18.1	8.18.32.5N.	17.38.50.6	
$\beta$ Aquilæ, E.	12.02.05.5	11.45.33	11.45.10	11.45.10	12	11.45.34	5.53.08.3N.	17.38.42.3	17.41.45
$\alpha$ Coronæ Borealis, W.	14th July	10. 0.16	9.29.32	9.28.50	9.5	9.29.20.5	27.27.03.5N	17.57.43.7	Beemulwilfa Camp
$\gamma$ Draconis, W.	35. 3.07	33.34.01	33.33.10	33.33.10	37.5	33.34.13	51.31.18 N.	17.57.05	A clear night,
$\alpha$ Scorpii, E.	39. 2.05	37. 3.11	37. 2.40	37. 2.40	43	37. 3.18.5	19.12.02 S.	17.51.35.5	17.54.15 C.
$\beta$ Scorpii, E.	46. 2.23	43.45.44	43.46.00	43.46.00	55	43.46.47	25.56.12 S.	17.50.35	Simachillum,
$\beta$ Libræ, E.	28. 0.08	26.18.31	26.19.00	26.19.00	20.5	26.19.14	8.34.33 S.	17.44.41	
$\alpha$ Coronæ Borealis, W.	8th July	10. 1.05.5	9.38.59	9.38.40	9.5	9.38.59.0	27.27.03.5N	17.48.04.5	17.46.28.8 C.

The four following Observations were taken by a quadrant made by RAMSDEN, eighteen inches radius, which shewed Altitudes,

$\alpha$ Lyrae, W.	Aug. 73. 3.10	69.17.13.6	69.17.35	-22	69.17.02.9	38.35.26.1 N.	17.52.28.4	Beemulwilfa,
$\beta$ Lyrae, W.	29th July	79.03.00.9	74.45.47.3	-15.6	74.45.38	33.07.16 N.	17.52.54.0	Head Quarters,
$\alpha$ Aquilæ*, E.	85.03. 2	80.24.24	80.24.50	-10	80.24.27	8.18.32 N.	17.54. 5	
$\beta$ Aquilæ†, E.	43.00.12	77.58.32	77.58.47	-12	77.58.28	5.53.08 N.	17.54.40	
$\alpha$ Draconis, W.	8th July	33.03.11	33.35.46.3	38	33.36.01	51.31.18 N.	17.55.17	
$\alpha$ Lyrae, W.	22.00.04	20.39.16	20.38.30	20	20.39.13	38.35.26 N.	17.56.13	
$\alpha$ Lyrae, W.	9th July	22.00.05	20.39.42	20.39.00	20	20.39.41	17.55.45	
$\epsilon$ Sagittarii, E.	55.03.08	52.19.27.3	52.18.50	75	52.20.18.6	34.27.59.5 S.	17.52.29	
$\alpha$ Aquilæ, E.	28th July	10.00.23.5	9.32.50	9.33.00†	10	9.33.05	6.18.32.5 N.	17.51.37.5
$\epsilon$ Sagittarii, E.	31st July	55.03.07	52.19.01	52.18.40	75	52.20.06	34.27.59.5 S.	17.52.06.5
$\alpha$ Lyrae, W.	22.00.06	20.40.09	20.39.30	20	20.40.15	38.35.26 N.	17.55.11	
$\alpha$ Cygni, W.	Sept. 28.01.13	26.34.46.6	26.15.00	29	26.35.22	44.31.05.3 N.	17.51.41.3	
$\beta$ Aquarii, E.	3d July	25.03.30	24.21.37.3	25	24.22.14	6.30.33 S.	17.51.41	
$\alpha$ Cephei, W.	27th July	46.02.22	43.45.17.3	55	43.46.04	61.40.42 N.	17.54.38	
$\beta$ Aquarii, E.	26.00.00	24.20.30	24.22.20	25	24.22.50	6.30.33 S.	17.52.17	
6 North Stars,							17.55.28	
6 South Stars,							17.52.14	

Head Quarters, Beemulwilfa,

The Mean, - 1753.51 C.

\* From the reading of  $\alpha$  Aquilæ, 29th August, subtract 48", + and from  $\beta$  Aquilæ 45"

Head Quarters, Cantonments at Beemulwilfa.  
The Mean, - 17.53.32 P.



## OBSERVATIONS at large for determining the Latitudes of PLACES.

From henceforward all the Observations were taken by Lieutenant COLEBROOK F.

Phenomenon and Face of the Quadrant.	Date	Reading.	Value.	Arch of 90	Equa- tion op- posed.	Length Du- rance or reduced.	Declination	Latitude by the Observa- tion.	Name of the place and its correct Latitude.
	1784	D.S.D.N.	0	0	"	0	0	0	
α Cephei, W.	Oct 16	01.24	43.32.06.8	43.31.30	53	43.32.42.3	61.40.42.2N	18.08.00	Vizianagur Pa-
β Aquarii, E.	22d	26.00.26	24.33.55.6	24.33.30	26	24.31.08.8	6.30.33 S	18.03.35.8	lace,
α Cygni, W.	23d	28.00.15.6	26.21.35.5	26.22.00	28	26.22.15.8	44.31.05.3N	18.08.49.6	
α Cephei, W.		46.01.25	43.32.32.9	43.31.46	54	43.33.03.5	61.40.42.2N	18.07.38.7	
β Aquarii, E.		26.00.26	24.33.55.6	24.33.35	26	24.34.11.3	6.30.33 S	18.03.38.3	18.05.52.3
α Cygni, W.	25th	28.00.27	26.21.51.9	26.27.00	28	26.26.24	44.31.05.2N	18.03.41.2	Brimling,
α Cephei, W.		46.02.00	43.36.30.2	43.35.50	54	43.37.04.1	61.40.42.2N	18.03.38.1	
β Aquarii, E.		26.00.19	24.30.51	24.30.00	26	24.30.51.5	6.30.33 S	18.00.18.0	18.01.59
γ Lacertæ, W.	26th	33.01.23	31.20.25.2	31.20.00	31.4	31.20.47	49.10.48 N	17.50.01	Santipolium,
Fumulothot, E.		51.03.07	48.34.00.8	48.33.30	64	48.34.49.5	30.45.25.6 S	17.49.23.8	
α Cephei, W.	31st	46.02.00	43.35.37.5	43.35.00	54	43.36.13	61.40.42.2N	18.05.29.2	Chintulwila,
β Aquarii, E.		26.00.18	24.30.24.6	24.30.00	25.7	24.30.38	6.30.33 S	18.00.05	18.02.17.1
α Cephei, W.	Nov 16	01.26	43.32.59.3	43.32.50	54	43.33.48.6	61.40.42.2N	18.06.53.6	Narrainpoore,
β Aquarii, E.	1st	26.00.23	24.32.36.5	24.32.20	26	24.32.54.3	6.30.33 S	18.02.21.3	
Fumulothot, E.		52.00.08	48.48.30.9	48.48.30	65	48.49.35.5	30.45.25.6 S	18.04.08.9	
β Cassiopeæ,									
W.		42.01.29	39.49.18.4	39.49.00	48	39.49.57.2	57.57.50 N	18.07.52.8	18.05.18.7
α Aquarii, E.	3d	20.02.26	19.24.33.5	19.24.00	20	19.24.36.8	1.21.30.6 S	18.03.06.2	Kundawilla,
γ Lacertæ, W.		33.00.11	31.01.05.1	31.01.30	34	31.01.51.6	49.10.48 N	18.08.56.4	18.06.01.3
α Aquarii, E.	4th	20.03.10	19.31.34.9	19.31.30	20	19.31.52.5	1.21.30.6 S	18.10.21.9	Timorgudha,
γ Lacertæ, W.		33.00.00	30.56.15.3	30.55.20	34	30.56.21.5	49.10.48 N	18.14.26.5	18.12.24.2
α Andromedis,									Sicacole Camp,
W.	5th	10.00.27	9.34.22	9.34.20	10	9.34.31	27.53.56 N	18.19.25	
γ Pegasi, F.		4.02.06	4.15.45.7	4.15.00	4	4.15.27	13.59.10 N	18.14.37	18.17.01
α Cephei, W.	7th	46.00.21	43.16.43.7	43.17.00	53	43.17.45	61.40.42.2N	18.22.57.2	Kalingapatam Camp,
Fumulothot, E.		52.01.11	49.03.54	49.04.00	65	49.05.02	30.45.25.6 S	18.19.36.4	18.21.16.8
Fumulothot, E.	9th	52.01.28	49.11.22.1	49.11.20	64	49.12.25		18.26.59.4	Kulliparoo,
α Andromedis,									
W.		10.00.02	9.23.22.4	9.23.30	10	9.23.36	27.53.53 N	18.30.17	
γ Pegasi, F.		4.03.02	4.28.04	4.27.30	5	4.27.52	13.59.07 N	18.26.59	18.28.39
α Andromedis,									Coffeboogavim,
W.	11th	9.02.27	9.06.14.5	9.05.40	10	9.06.07	27.53.53 N	18.47.46	
γ Pegasi, F.		5.00.05	4.43.27	4.43.0	4.5	4.43.18	13.59.07.5N	18.42.55.5	18.45.05.8
Fumulothot, E.	14th	53.00.10	49.45.38.7	49.45.30	67	49.40.41.4	30.45.22.5 S	19.01.19	Kutwaul Ta-
β Cassiopeæ,									lanby,
W.		4.01.28	38.52.37.1	38.52.00	56	38.53.04.6	57.57.46.7N	19.04.42.1	19.03.00.5

## OBSERVATIONS at large for determining the Latitudes of PLACES.

Phænomenon and P. & Q. of the Quadrant.	Date.	ARC OF 95.		Arch of 90	Equation of ap- plied.	Zenith Dis- tance cor- rected.	Declination	Latitude by the ob- serva- tion	Name of the place and its cor- rect Latitude.
		Reading.	Value.						
α Andromedæ, Nov	1784.	D.S.D.N.	0 " "	" " "	" " "	" " "	" " "	" " "	
W.	15th.	9 01.10	8.44.42.5	8.45.00	8	8.45.00	27.53.59 N	19.08.59	Ichhapoor,
γ Pegasi, E.		5 01.23	5 05.25.3	5 05.00	5	5 05.17.5	13.59.13.3 N	19.04.35.8	19 06.45
7 Lacertæ, W.	16th.	31.03.10	29.50.20	29.49.40	33	29.50.33	49.10.45 S	19 20.12	19.41.00
Fumulhoot, E.		53.01.15	50.01.54.3	50.02.00	67	50.03.04.2	30.45.22.5 S	19.17.41.5	19 18.57
7 Lacertæ, W.	17th.	31.03.13	29.51.30.1	29.51.00	33	29.51.52.0	49.10.45 N	19.18.52.4	19 18.57
Fumulhoot, E.		53.01.10	49.59.40.4	49.59.30	67	50.00.42.2	30.45.22.5 S	19.15.19.5	19 17.05.5
E.	18th.	53.01.24	50.05.51.0	50.05.30	67	50.06.48		19.21.25.5	Ganjam Camp,
β Cassiopææ,									
W.		41.00.13	38.31.58	38.31.00	46	38.32.15	57.57.53 N.	19.25.38	19 23.32
Fumulhoot, E.	25th.	53.02.06	50.12.00.7	50.12.00	67	50.13.07.5	30.45.22.5 S.	19.27.45	19 23.32
β Cassiopææ,									
W.		41.00.03	38.27.34.7	38.26.50	45.6	38.27.58	57.57.50.0 N.	19.29.55	19 28.50
Fumulhoot, E.	26th.	43.02.14	50.15.31.7	50.15.30	67	50.16.38	30.45.22.5 S.	19.31.15.5	19 28.50
β Cassiopææ,									
W.		40.03.25	38.23.11	38.23.10	45.6	38.23.56.1	57.57.53 N.	19.33.57	19 32.36.5
Fumulhoot, E.	29th.	53.03.04	50.25.11.8	50.24.40	67	50.26.02	30.45.22.5 S.	19.40.40.5	Manickpattan,
α Andromedæ,									
W.		8.02.29	8.10.52.2	8.10.50	8	8 10 59.1	27.53 59.0 N.	19.43.00	
α Cassiopææ,									
W.		38.00.01	35.37.56.4	35.37.30	40.8	35.38.24	55.21.23.0	19.42.59	19 41.50
Fumulhoot, E.	Dec.	53.03.21	50.32.40	50.32.30	67	50.32.42	30.45.22.5 S.	19.42.10.5	Jaggermat,
γ Pegasi, E.	4th.	6.00.21	5.46.13.7	5.46.30	6	5.46.43	13.59 13.7 S.	19.45.56.3	
α Cassiopææ,									
W.		37.03.22	35.33.06.3	35.32.40	41	35.33.34.2	55.21.23 N.	19.47.49	
α Andromedæ,									
W.		8.02.12	8.03.26	8.03.00	8	8.03.21	27 53 59 N	19 50.38	19 41.50
α Andromedæ,									
W.	7th.	8.01.21	7.53.17.5	7.53.20	8	7.53.27	27.53.59 N	20.00.32	Ahmetpoot
α Cassiopææ,									
W.		37.02.26	35.20.48	35.21.00	40	35.21.34	55.21.23 N	19.59.49	
α Cassiopææ,									
W.		45.01.24	42.35.52	42.36.00	52	42.36.44	62.36.07 N	19 59.23	
γ Pegasi, E.		6.01.06	5.54.12	5.54.00	6	5.54.12	13.59.13.3 N	19.53.25.3	
η Ceti, E.		33.01.05	31.12.30.7	31.12.00	34	31.12.40.4	11.19.35 S	19.53.11.1	
θ Ceti, E.		31.00.17	29.11.13.3	29.10.30	32	29.11.23.6	9.17.47 S	19.53.36.6	19.56.40.2
α Cassiopææ,									
W.		37.02.05	35.11.34.3	35.11.00	40	35 11.57	55.21.23 N	20.09.26	Pecply,
β Cassiopææ,									
W.	8th.	41.02.07	38.57.27.1	38.57.00	46	38.57.59.6	59.01.56 N.	20.08.56	
η Ceti, E.		33.02.00	31.24.22.6	31.24.00	34.4	31.24.46	11.19.35 S	20.05.11	20.07.11
α Andromedæ,									
W.	9th.	8.00.08	7.33.31	7.33.00	7.5	7.33.23	27.53.59 N.	20.20.36	Bullunat,
γ Pegasi, E.		6.02.22	6.15.18	6.15.30	6	6.15.30	13.59.13 N.	20.14.43	20 17.40

## OBSERVATIONS at large for determining the Latitudes of PLACES.

Phænomenon and Face of the Quadrant.	Date.	ARCH OF 96.	Value.	Arch of 90.	Equation of place.	Zenith Distance corrected.	Declination.	Latitude by the observation.	Name of the place and its correct Latitude.
1784. D.S.D.N.									
γ Cassiopææ, W.	17th, Dec.	41.02.22	39.04.02.6	39.03.30	46	39.04.30	59.52.54 N	20.28.21.7	Sowlagunda, near Kuttack,
α Ceti, E.		33.03.13	31.43.59	31.43.30	35	31.44.20	11.19.35 S.	20.24.45	20.26.33.5
1 Cassiopææ, W.	15th,	44.02.16	41.50.09.4	41.49.40	51	41.50.45.7	62.36.07 N.	20.45.21.3	Koomerciah River, north side,
α Piscium, E.		20.00.29	18.57.44.7	18.57.40	19	18.58.01.4	1.43.03 N.	20.41.01.4	20.43.13
α Cassiopææ, W.	17th,	36.02.20	34.26.18.5	34.26.00	39	34.26.48.3	55.21.23 N.	20.54.34.7	Jehaujeepore River, north side,
α Ceti, E.		34.01.04	32.18.19.3	32.08.20	35	32.08.55	11.19.35 S.	20.49.20	20.51.57
γ Cassiopææ, W.	19th,	41.00.15	38.32.50.5	38.32.30	45	38.33.25.3	59.32.54 N.	20.59.28.7	Chorakootce,
δ Cassiopææ, W.		40.02.18	38.06.02.1	38.05.30	44	38.06.30	59.06.56 N.	21.00.26	20.59.09
θ Ceti, E.		32.01.04	30.15.49.3	30.15.20	33.3	30.16.08	9.17.47 S.	20.58.21	Raneeka Taulaub,
1 Cassiopææ, W.	20th,	44.00.29	41.27.44.7	41.27.30	50	41.28.27.4	62.36.07 N.	21.07.40.4	21.06.46
δ Ceti, E.		23.00.29	21.42.06	21.42.00	22	21.42.25	0.36.32 S.	21.05.53	
α Cassiopææ, W.	21st,	36.01.15	34.05.39.3	34.05.20	38	34.06.08	55.21.23 N.	21.15.51	Kaunfe Baunfe,
δ Cassiopææ, W.		40.01.16	37.51.05.7	37.51.00	44	37.51.47	59.06.56 N.	21.15.09	
η Ceti, E.		34.02.24	32.31.10.3	32.30.40	36	32.31.31.2	11.19.35 S.	21.11.56.2	21.13.52.3
θ Ceti, E.		32.02.06	30.30.45.7	30.30.20	33	30.31.06	9.17.47 S.	21.13.19	Aumnulla,
α Cassiopææ, W.	22d,	36.00.24	33.55.33	33.55.30	38	33.56.09.5	55.21.23 N.	21.25.13.5	21.23.01.2
η Ceti, E.		34.03.12	32.39.57.3	32.39.40	35.4	32.40.24	11.19.35 S.	21.20.49.0	
1 Cassiopææ, W.	23d,	43.02.24	40.57.05.4	40.57.00	49.3	40.57.52	62.36.07 N.	21.38.14.3	Daumdurpoor,
γ Andromedis, W.		20.03.25	19.38.10.5	19.37.40	21.8	19.38.17	1.17.22 N.	21.39.50	
α Piscium, E.		21.00.24	19.51.48	19.51.00	21	19.51.45	1.43.03 N.	21.34.48.2	21.36.38
δ Ceti, E.		23.02.18	22.09.47.2	22.10.00	22.4	22.10.16	0.36.32 S.	21.33.44.7	Soobanreeka River, at Rajje Gaut, on the Ballalore side,
1 Cassiopææ, W.	24th,	43.02.06	40.49.19.8	40.49.00	49	40.19.54.4	62.36.07 N.	21.46.12.4	21.45.18.5
δ Ceti, E.		23.03.09	22.19.54	22.19.30	22	22.20.04	0.36.32 S.	21.43.32.0	Jellafore Camp.
1 Cassiopææ, W.	26th,	43.01.30	40.46.10	40.46.00	49	40.46.54	62.36.07 N.	21.49.13.0	
α Eridani, E.		34.00.06	31.55.08	31.55.08	35	31.55.43	10.13.26.6 S.	21.42.16.4	21.45.18.5
δ Cassiopææ, W.	27th,	39.03.02	37.16.49	37.16.00	48	37.17.13	59.06.56 N.	21.49.43	
δ Ceti, E.		23.03.10	22.20.20	22.20.00	24	22.20.34	0.36.32 S.	21.44.02	21.46.53
η Ceti, E.	28th,	35.01.27	33.14.40.6	33.14.00	38	33.14.58.3	11.19.35 S.	21.55.23.3	Dantoon Camp.
δ Cassiopææ, W.		39.02.11	37.06.32.5	37.06.00	43	37.06.59.3	59.06.56 N.	21.59.56.7	21.57.40

## OBSERVATIONS at large for determining the Latitudes of PLACES.

Phænomenon and Face of the Quadrant.	Date.	ARCH OF 96.		Arch of 90	Equi- valent op- timal	Zenith Dif- ference cor- rected.	Declination.	Latitude by the observa- tion.	Name of the place (as cor- rected Latitude.
		Reading.	Value.						
γ Cassiopeæ, W.	1784. Dec. 29th,	D.S.D.N. 39.03.21	0 " " "	0 " " "	"	0 " "	0 " "	0 " "	
γ Cassiopeæ, W.	30th,	39.03.21	37.25.10	37.24.40	42	37.25.37	59.32.55.5N.	22.07.18	Khutnagur,
η Ceti, E. γ Cassiopeæ, W.	30th,	35.02.06	33.19.30.6	33.19.10	37	33.19.57.3	11.19.35 S.	22.00.22	22.03 50
δ Cassiopeæ, W.	30th,	39.03.02	37.16.49	37.16.30	42	37.17.22	59.32.55.5N.	22.15.33.5	Mokurram- poor,
η Ceti, E.	30th,	39.01.08	36.51.19.7	36.50.40	43	36.51.43	59.06.56 N.	22.15.13	0 " "
		35.02.27.5	33.28.57.5	33.28.20	37	33.29.16	11.19.35 S.	22.09.41	22 12 32.1
γ Persei, W.	31st.	42.00.29	30.12.44.7	30.13.00	33	30.13.25.4	52.37.59 N.	22.24.33.6	Kaffai River,
ε Persei, W.		18.03.14	17.40.50.4	17.40.30	18	17.40.58.2	40.06.50 N.	22.25.51.8	
δ Ceti, E.		24.01.26	22.55.29.3	22.55.00	24	22.55.39	00.36.32 S.	22.19.07	0 " "
12 Eridani, E.		55.02.16	52.08.54.5	52.09.10	73	52.10.15.3	29.51.02 S.	22.19.13.3	22.22.11.3
δ Cassiopeæ, W.	Jan. 4th,	39.00.10	36.38.08.7	36.37.10	42	36.38.36.3	59.06.56 N.	22.28.19.7	Midnapoor Fort,
ε Cassiopeæ, W.		42.03.07	40.07.46	40.07.30	48	40.08.26	62.36.07 N.	22.27.41	0 " "
δ Ceti, E.		24.02.00	22.58.07.5	22.58.00	24	22.58.48	00.36.32 S.	22.22.16	22.25.08.3
ε Cassiopeæ, W.	5th,	42.03.05	40.06.53	40.06.00	48	40.07.15	62.36.07 N.	22.28.52	Bunpoor,
δ Ceti, E.		24.02.06	23.00.46	23.00.30	24	23.01.02	00.36.32 S.	22.24.30	22 26 41
δ Cassiopeæ, W.	6th,	38.03.12	36.24.57.7	36.25.00	43	36.25.42	59.06.56 N.	22.41.14	Narraindeo- wul,
12 Eridani, E.		55.03.22	52.25.36.4	52.25.30	75	52.26.48.2	29.51.02 S.	22.35.46.2	22 38.30
γ Persei, W.	7th,	31.03.09	29.49.53.6	29.49.20	33	29.50.10	52.37.59 N.	22.47.49	Madapoor,
12 Eridani, E.		56.00.10	52.34.24	52.34.40	74	52.35.46	29.51.02 S.	22.44.44	22 46 16.5
γ Persei, W.	8th,	31.03.05	29.48.03	29.47.50	33	29.48.32	52.37.59 N.	22.49.27	Churdaound,
12 Eridani, E.		56.00.09	52.34.11	52.34.00	74	52.35.20	29.51.02 S.	22.44.18	22 46 52.5
γ Persei, W.	10th,	32.00.03	30.01.19.8	30.01.00	33	30.01.42.5	52.37.39 N.	22.36.16.5	Habra Gaut,
12 Eridani, E.		55.03.14	52.22.05.4	52.22.10	74	52.33.21.7	29.51.02 S.	22.32.19.7	22.34 18.1

MR. BURROWS published, in the Lady's Diary, a Theorem similar to mine, page 71. he shewed it to me last year: my original Book of Observations, convinced him, that his publication could not have been known to me when I wrote the Theorem.







### III.

## A ROYAL GRANT OF LAND,

*Engraved on a Copper Plate, bearing date twenty-three years before CHRIST,  
and discovered among the ruins at MONGUEER.*

Translated from the Original *Sanfcrit*, by CHARLES WILKINS, Esq. in the Year 1781

D E B P A A L D E B\*.

PROSPERITY!

**H**IS wishes are accomplished. His heart is steadfast in the cause of others. He walks in the paths of virtue. May the achievements of this fortunate Prince cause innumerable blessings to his People!

By displaying the strength of his genius, he hath discovered the road to all human acquirements; for being a *Soogot* (1) he is Lord of the Universe.

*Gopaal*, King of the World, possessed matchless good Fortune: he was Lord of two Brides; the Earth and her Wealth. By comparison of the learned, he was likened unto *Preetoo*, (2,) *Sogor*, (3,) and others, and it is credited.

When his innumerable army marched, the heavens were so filled with the dust of their feet, that the birds of the air could rest upon it.

\* In this translation the *Sanfcrit* names are written, as they are pronounced in *Bengal*; but, in the following paper, the translator has adopted the more elegant pronunciation of *Várânes* and *Cairbmir*



He acted according to what is written in the *Shastra*, (1,) and obliged the different sects to conform to their proper tenets. He was blessed with a son, *Dhormo Paal*, when he became independent of his forefathers, who are in heaven.

His elephants moved like walking mountains; and the earth, oppressed by their weight, and mouldered into dust, found refuge in the peaceful heavens.

He went to extirpate the wicked, and plant the good; and happily his salvation was effected at the same time: for his servants visited *Kedaar*, (2,) and drank milk according to the law: and they offered up their vows, where the Ganges joins the ocean, and at *Gohornaa*, (3,) and other places, (4.)

When he had completed his conquests, he released all the rebellious princes he had made captive; and each returning to his own country laden with presents, reflected upon this generous deed, and longed to see him again; as mortals, remembering a pre-existence, wish to return to the realms of light.

This prince took the hand of the daughter of *Porotol*, Raajaa of many countries, whose name was *Romnaa Debee*; and he became sculed.

The people, being amazed at her beauty, formed different opinions of her; some said it was *Lockee* (5) herself in her shape; others, that the earth had assumed her form; many said it was the Raajaa's fame and reputation; and others that a household goddess had entered his palace. And her wisdom and virtue set her above all the ladies of the court.

This

This virtuous and praise-worthy prince's bore a son, *Deb Paal Deb*, as the shell of the ocean produces the pearl :——

In whose heart there is no impurity ; of few words, and gentle manners ; and who peaceably inherited the kingdom of his father, as *Bodheesotwo* (1) succeeded *Soogot*.

He who, marching through many countries making conquests, arrived with his elephants in the forests of the mountains of *Beendhyo*, (2,) where seeing again their long lost families, they mixed their mutual tears ; and who going to subdue other princes, his young horses meeting their females at *Aon-boge* (3), they mutually neighed for joy.

He who has opened again the road of liberality, which was first marked out in the *Kreeto Joog* (4) by *Bolee*, (5,) in which *Bhaargob* (6) walked in the *Tretaa Joog*, (7,) which was cleansed by *Korno* (8) in the *Dwapoor Joog*, (9,) and was again choked up in the *Kolee Joog* (10) after the death of *Sokodwesee*, (11.)

He who conquered the earth from the source of the *Ganges* as far as the well-known bridge which was constructed by the enemy of *Dosaasyo*, (12,) from the river of *Luckeecoal* (13) as far as the ocean of the habitation of *Boroon*, (14.)

At *Mood-go-gheeree*, (15,) where is encamped his victorious army, across whose river a bridge of boats is constructed for a road, which is mistaken for a chain of mountains, where immense herds of elephants, like thick black clouds, so darken the face of day, that people think it the season of the rains ; whither the princes of the north send so many troops of horse,

horse, that the dust of their hoofs spreads darkness on all sides; whither to many mighty chiefs of *Jumbodweep* (1) resort to pay their respects, that the earth sinks beneath the weight of the feet of their attendants. There *Deb Paal Deb* (who, walking in the footsteps of the mighty lord of the great *Soogots*, the great commander, *Raajaa of Mohaa Raajaas*, *Dhormo Paal Deb*, is himself mighty lord of the great *Soogots*, a great commander, and *Raajaa of Mohaa Raajaas*) issues his commands. To all the inhabitants of the town of *Meseeka*, situated in *Kreemcelaa*, in the province of *Sree Nagar*, (2,) which is my own property, and which is not divided by any land belonging to another; to all *Raanoh* and *Raaje-pootro*; to the (3) *Omaatyo*, *Mohaa-laarttaa-kreeteecho*, *Mohaa-Dondo-Nayh*, *Mohaa-Pro-ta-haa*, *Mohaa Saamont Moo*, *haa-Dow-Saadhon Saadhoneeko*, *Mohaa Koomaaraa-Maty*; to the *Prumaatree* and *Sorokhongo*; to the *Raajastaneeyo*, *Ooporeeko*, *Daasaaporaadheeke*, *Chowrod-dhorneeko*, *Daandeeke*, *Dondopaa-seeko*, *Sowl-keeko*, *Gowlmeeko*, *Kyotropo*, *Praantopaalo*, *Kothtopaalo* and *Kaandaawohyo*, to the *Todaajooktoke* and the *Berneepooktoke*; to the keeper of the elephants, horses and camels; to the keeper of the mares, colts, cows, buffaloes, sheep, and goats; to the *Dootoprysoneeko*, *Gomaa-Gomeeko*, and *Obheeta-oromaano*; to the *Beesoypotee*, *Toropotee*, and *Toreeko*. To the different tribes, *Gour*, *Maaloh*, *Ahoso*, *Hoon*, *Koolceko*, *Kornaato*, *Laasaato*, and *Bhoto*; to all others of our subjects, who are not here specified; and to the inhabitants of the neighbouring villages, from the *Brahmon* and fathers of large families, to the tribes of *Medo*, *Ondhoroko*, and *Chondauo*.

Be it known that I have given the above-mentioned town of *Meeseeka*, whose limits include the fields where the cattle graze, above and below the surface, with all the lands belonging to it; together with all the *Mango* and *Modhoo* trees; all its waters, and all their banks and verdure; all its  
rents

rents and tolls, with all fines for crimes, and rewards for catching thieves. In it there shall be no molestation, no passage for troops; nor shall any one take from it the smallest part. I give likewise every thing that has been possessed by the servants of the Raajaa. I give the Earth and Sky, as long as the Sun and Moon shall last. Except, however, such lands as have been given to God, and to the *Braahmons*, which they have long possessed and now enjoy. And that the glory of my father and mother, and my own fame, may be increased, I have caused this *Saason* (1) to be engraved, and granted unto the great *Botho Bechkoraato Meesro*, who has acquired all the wisdom of books, and has studied the *Beads* (2) under *Oslaayono*; who is descended from *Owpomonyoto*; who is the son of the learned and immaculate *Botho Boraahoraato*; and whose grandfather was *Botho Beesworaato*, learned in the *Beads*, and expert in performing the *Jog*, (3).

Know all the aforefaid, that as bestowing is meritorious, so taking away deserves punishment; wherefore leave it as I have granted it. Let all his neighbours, and those who till the land, be obedient to my commands. What you have formerly been accustomed to perform and pay, do it unto him in all things. Dated in the 33d *Sombot*, (4,) and 21st day of the month of *Maturgo*.

Thus speak the following *Slokes* (5) from the *Dharmo Onoosaason*:

1. " *Ram* hath required, from time to time, of all the Raajaas that may reign, that the bridge of their beneficence be the same, and that they do continually repair it.

2. " Lands have been granted by *Sogor*, and many other Raajaas; and the fame of their deeds devolves to their successors.

3. " He

3. " He who dispossesses any one of his property, which I myself, or  
" others, have given, may he, becoming a worm, grow rotten in ordure with  
" his forefathers!

4 " Riches and the life of man are as transient as drops of water upon a  
" leaf of the lotus. Learning this truth, O man! do not attempt to deprive  
" another of his reputation."

The Raajaa, for the publick good, hath appointed his virtuous son,  
*Raajyo Paal*, to the dignity of *Jowto Raajaa*. He is in both lines of de-  
cent illustrious, and hath acquired all the knowledge of his father.

# N O T E S.

Page 123. (1) *Sogot*—signifies an atheist, or follower of the tenets of *Sogot*, a philosopher, who is said to have flourished at a place called *Kelot*, in the province of *Bihar*, one thousand years after the commencement of the *Kale Jang*, or *Iron Age*; of which this is the 4882d year. He believed in visible things only, or such as may be deduced from effects the cause of which is known—as from smoke the existence of fire. He wrote many books to prove the absurdity of the religion of the *Brahmons*; and some upon astronomy and other sciences, all which are said to be now in being. He further held that all our actions are attended by their own rewards and punishments in this life; and that all animals, having an equal right to existence with man, they should not be killed either for sport or food.

(2) *Prctoo*—was the son of *Benn*, and *Raajaa* of a place called *Bectoor*, near *Lucknow*. He flourished in the first age of the world, and is said to have levelled the earth, and, having prepared it for cultivation, obliged the people to live in society.

(3) *Sogot*—the name of a *Raajaa* who lived in the second age at *Oyodhoo*, and is said to have dug the rivers.

Page 124. (1) *Shaastra*—book of divine ordinations. The word is derived from a root signifying to command.

(2) *Kidaar*—a famous place, situated to the north of Hindostan, visited, to this day, on account of its supposed sanctity.

(3) *Gakoonna*—a place of religious resort near *Punjab*.

(4) This and a few other passages appear inconsistent with the principles of a *Sogot*; to reconcile it therefore, it should be remarked, that, as he was issuing his orders to subjects of a different persuasion, it was natural for him to use a language the best calculated to strike them with awe, and bind them to a performance of his commands. The *Pandit*, by whose assistance this translation was made, when he was desired to explain this seeming contradiction, asked whether we did not, in our courts, swear a *Musliman* upon the *Koran*, and a *Hindoo* by the waters of the *Ganges*, although we ourselves had not the least faith in either.

(5) *Lockee*—the *Hindoo* goddess of fortune.

Page 125. (1) *Balbesforawo*—was the son of *Sogot*.

(2) *Birahyo*—name of the mountains on the continent near *Ceylon*.

(3) *Kamboge*—now called *Cambay*.

(4) *Kiree Jang*—the first age of the world, sometimes called the *Suttee Jang*, or age of purity.

(5) *Bale*—a famous giant of the first age who is fabled to have conquered earth, heaven, and hell.

(6) *Rhaugab*—a *Brahman*, who, having put to death all the princes of the earth, usurped the government of the whole.

(7) *Trecta Jang*—the second age, or of three parts good.

(8) *Kano*—a famous hero in the third age of the world. He was general to *Dwanjathoor*, whose wars with *Joodistee* are the subject of the *Mahabharat*, the grand epick poem of the *Hindoo*.

(9) *Dwanpo Jang*—the third age of the world.

(10) *Kale Jang*—the fourth or present age of the world, of which 4882 years are elapsed.

(11) *Sakturjee*—an epithet of *Beekromadeetyo*, a famous Raajaa. He succeeded his brother *Sohnadeetye*, whom he put to death.

(12) *Dyjanjy*—one of the names of *Raaban*, whose wars with *Raam* are the subject of a poem called the *Raamajan*.

(13) *Luckecool*—now called *Luckepoor*.

(14) *Bruen*—God of the ocean.

According to this account the Raajaa's dominions extended from the Cow's Mouth to Adam's Bridge in *Ceylon*, said to have been built by *Raam* in his wars with *Raaban*; from *Luckepoor* as far as *Gorzerat*.

(15) *Misa ro-gheer*—now called *Monguer*.

Page 126. (1) *Jumb adu, ee*—according to the Hindoo geography, implies the habitable part of the earth.

(2) *Sree Nogor*—the ancient name of *Patna*.

(3) *Omaatyo*, prime minister. *Mibau-kaarttaa-kreeteko*, chief investigator of all things. *Mo-haa-Dondo-Nayk*, chief officer of punishments. *Mobaa-Protee-haar*, chief keeper of the gates. *Mobaa-Saamonto*, generalissimo. *Mobaa-Dow-Saadbou-Saadbomeko*, chief obviator of difficulties. *Mobaa-Koomaaraa-Maty*, chief instructor of children. *Promaatree*, keeper of the records. *Sorobbonge*, patrols. *Ranjoshtanceyo*, viceroy. *Ooporeeko*, superintendent. *Daafaa-raadbeko*, investigator of crimes. *Chow-ro-dbo-roneko*, thief catcher. *Daan-deeko*, mace-bearer. *Dondo-paseeko*, keeper of the instruments of punishment. *Sowl-keeko*, collector of customs. *Gowlmeeko*, commander of a small party. *Kyetrope*, supervisor of cultivation. *Praantipaalo*, guard of the suburbs. *Kotbiapaalo*, commander of a fort. *Kaandaaraktyo*, guard of the wards of the city. *Todnapuktoko*, chief guard of the wards. *Beenerjook-tyko*, director of affairs. *Dootapryseuko*, chief of the spies. *Gumaa-Gomeeko*, messengers. *Olbicawo-romaano*, swift messengers. *Beefjopotee*, governor of a city. *Toropotee*, superintendent of the rivers. *Toreeko*, chief of the boats.

Page 127. (1) *Saafon*—signifies an edict.

(2) *Beads*—Hindoo Scriptures.

(3) *Jog*—sacrifice.

(4) *Sombot*—implies the era of Raajaa *Beekromadeetyo*. The *Brabmons* throughout Hindoستان keep time according to the three following epochs: The *Kolyobdo*, from the flight of *Kresfzino*, or commencement of the *Koke Jog*, 4882 years. The *Sombot*, from the death of *Beekromadeetyo*, 1837 years. The *Sokaabd*, from the death of Raajaa *Soko* 1703.

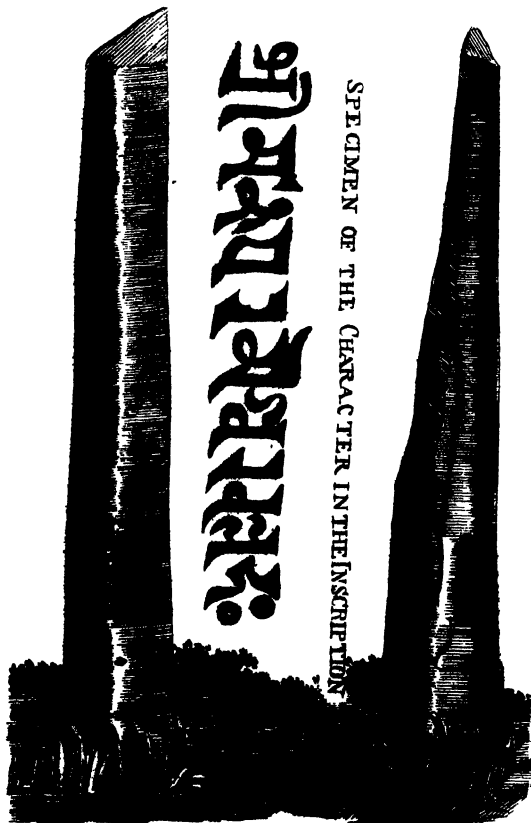
(5) *Sloke*.—*stanzas*, commonly, but erroneously, written *Aflogues*.





FRONT VIEW

SIDE VIEW



## IV.

AN

## INSCRIPTION ON A PILLAR NEAR BUDDAL.

TRANSLATED FROM THE SANSKRIT,

By CHARLES WILKINS, Esq.

SOME time in the month of November, in the year 1780, I discovered, in the vicinity of the town of *Buddal*, near which the Company have a factory, and which at that time was under my charge, a decapitated monumental column, which at a little distance has very much the appearance of the trunk of a coco-nut tree broken off in the middle. It stands in a swamp overgrown with weeds, near a small temple dedicated to *Hargourē*, whose image it contains. Upon my getting close enough to the monument to examine it, I took its dimensions, and made a drawing of it; and soon after a plate was engraved, from which this accompanying is an impression.

It is formed of a single stone of a dirty grey complexion; and it has lost by accident a considerable part of its original height. I was told upon the spot that it had, in the course of time, sunk considerably in the ground; but upon my digging about the foundation I found this was not the case. At a few feet above the ground is an inscription, engraved in the stone, from which I took two reversed impressions with printer's ink. I have lately been so fortunate as to decypher the character; and I have the honour to lay before the Society a transcript of the original in the modern writing, and a translation; and at the same to exhibit the two impressions I took from the stone itself.

The original character of this inscription is very different from the modern form; but it so much resembles that on the plate found by Col. WATSON at *Mongueer*, that I am induced to conclude it to be a work of the same period. The language is *Sāmskr̥t̥*, and the whole is comprised in twenty-eight metrical verses of various measures.

CHARLES WILKINS.

14<sup>th</sup> July 1785.

PROSPERITY!

## PROSPERITY !

## I.

*VĒĒRĀ DĒV* was of the *Sāndvilyā* race, (1,) from him was descended *Pānchāl*; of whose generation, and of whom, was *Gārgā* born.

## II.

He, another *Sāhrā*, (2,) was ruler but of one quarter, and had no authority in other regions. He, too, was defeated by *Dityā* (3) chiefs; but being a virtuous prince, he became supreme over every country without reserve; and his conduct was such, that he laughed *Irēhāspatē* (4) to scorn.

## III.

*Eek* (5) was his wife; and, like love, she was the mistress of his heart. She was admired for the native purity of her mind, and her beauty was like the light of the moon.

(1) A tribe of Brāhmāns still extant.

(2) *Endrā*, the God of the Heavens, who is supposed to be the Guardian of the East.

(3) Evil spirits. *Eendā* is said to have lost his kingdom, for a while, to the *Āsōōrs*, or Evil spirits.

(4) The Tutor of the good spirits and the Planet Jupiter.

(5) Love, Desire.

## IV.

In his countenance, which was like the flower of the waters, (1,) were to be traced the lines of four sciences, (2). The three worlds were held in subjection by his hereditary high rank.

From these two was descended a *Brāhmin* like *Kāmālāyānēṣṣ*, (3,) and he took unto himself the name of *Srēṣṣ Dārthā-pānēṣṣ*.

## V.

Whose country (extending to *Rēvā-Jānāh*, (4,) to the father of *Gowrēṣṣ*, (5,) whose piles of rocks reek with the juice exuding from the heads of intoxicated elephants, and whose snow-white mountains are brightened by the sun's rays; to the two oceans: to that whence *Arōṣṣ* (6) riseth from its bed, and to that wherein the sun sinketh in the west) the Prince *Srēṣṣ Dēv Pāl*, (7,) by his policy, rendered tributary:

## VI.

At whose gates (although the prospect, hidden by the dust arising from the multitude of marching force, was rendered clear from the earth being

(1) The Lotus.

(2) Arms, Music, Mechanics, Physics.

(3) *Brāhmin*.

(4) Perhaps the *Narbādā*.

(5) The snowy mountains that part India from Tartary. *Gowrēṣṣ*, one of the names of the *Pār-cāṣṣ*, the consort of *Srēṣṣ*.

(6) The charioteer of the sun.—The Aurora of the Hindoos.

(7) If this be the prince mentioned in the copperplate found by Col. WATSON, he reigned at Mongueer above 1800 years ago.

watered by constant and abundant streams, flowing from the heads of lustful elephants of various breeds) flood, scarce visible, amongst the vast concourse of nobles flocking to his standard from every quarter, *Srē Dēv Pāl*, in expectation of his submission.

## VII.

Whose throne that Prince (who was the image of *Eñdrā*, and the dust of whose feet was impressed with the diadems of sundry potentates) himself ascended with a flash of glory, although he had formerly been wont to offer him large sums of *Pēṭṭās*, (1,) bright as the lunar rays.

## VIII.

To him was born, of the Princess *Sārkhārā*, the Brāhmān *Sēmīswēr*, who was like *Sēm*, (2,) the offspring of *Ātrēṣ*, and a favourite of the Most High.

## IX.

He adopted the manners of *Dh'n'ujay*, (3,) and did not exult over the ignorant and ill-favoured. He spent his riches amongst the needy. He neither vainly accepted adulation, nor uttered honey words. His attendants were attached by his bounty; and because of his vast talents, which the whole universe could not equal, he was the wonder of all good men.

(1) A square coin.

(2) The moon.

(3) One of the sons of Pandoo, commonly called *Ajoun*.

## X.

Anxious for a home and an asylum, he took the hand of *Rāhmā*, (1,) a Princess of his own likeness, according to the law, even as *Sēv* the hand of *Sēvā*, (2,)—even as *Hārī* (3) the hand of *Lakshmi*.

## XI.

From this pair proceeded into life, bursting forth like *Gōbhā*, (4,) with a countenance of a golden hue, the fortunate *Kēdārā Mēśrā*, whose actions rendered him the favourite of heaven.—The lofty diadem, which he had attained, shone with faultless splendour, kissing the vast circumference of the earth. His extensive power was hard to be limited; and he was renowned for boundless knowledge raised from his own internal source.

## XII.

The ocean of the four sciences, which had been at a single draught drunk up, he brought forth again, and laughed at the power of *Agastya*, (5).

## XIII.

Trusting to his wisdom, the king of *Gowr* (6) for a long time enjoyed the country of the eradicated race of *Ötkal*, (7), of the *Huns* (8)

(1) A princess of this name is also mentioned in Colonel WATSON'S plate.

(2) *Sēvā* is the feminine of *Sēv*.

(3) *Hārī*, a name of *Vishnu*.

(4) *Gōbhā*, a name of *Kṛti*.

(5) Who is said to have drunk up the ocean.

(6) The kingdom of *Gowr* anciently included all the countries which now form the kingdom of *Bengal*, on this side the *Bāhmāpūtrā*, except *Monguer*.

(7) *Orixa*.

(8) *Huns*.

of humbled pride, of the kings of *Drāṭṭér* (1) and *Gōṛjān*, (2,) whose glory was reduced, and the universal sea-girt throne.

## XIV.

He considered his own acquired wealth the property of the needy, and his mind made no distinction between the friend and the foe. He was both afraid and ashamed of those offences which condemn the soul to sink again into the ocean of mortal birth; and he despised the pleasures of this life, because he delighted in a supreme abode.

## XV.

To him, emblem of *Vṛṣṇāspātēṣṣ*, (3,) and to his religious rites, the prince *Srē Sōrā Pāl* (who was a second *Endrā*, and whose soldiers were fond of wounds) went repeatedly; and that long and happy companion of the world, which is girt with several oceans as with a belt, was wont, with a soul purified at the fountain of faith, and his head humbly bowed down, to bear pure water before him.

## XVI.

*Vānuā*, of celestial birth, was his consort, with whom neither the fickle *Lākshmiṭē*, nor *Sātēṣ*, (4,) constant to her lord, were to be compared.

(1) A country to the south of the Carnatick.

(2) Gozerat.

(3) The preceptor of the good spirits, and the planet *Jupiter*.

(4) The consort of *Sṛēv*.



## XVII.

She, like another *Dīvāhēē*, (1,) bore unto him a son of high renown, who resembled the adopted of *Yāsōdhā*, (2,) and husband of *Lākshmiē*, (3.)

## XVIII. \*

This youth, by name *Srēē Gōrāvā Mēśrā* was acquainted with all the constellations. He resembled *Rām*, the son of *Jāmādēgnī*, (4.) He was another *Rām*.

## XIX.

His abilities were so great, that he was solicitous to discover the essence of things, wherefore he was greatly respected by the Prince *Srēē Nārāyaṇ Pāl*. What other honour was necessary?

## XX.

His policy (who was of no mean capacity, and of a reputation not to be conceived) following the sense of the *Vēds*, was of boundless splendor, and, as it were, a descent of *Dhārmā*, the Genius of Justice. It was regulated by the example of those who trust in the power of speech over things future, who stand upon the connexion of family, who are in the exercise

(1) The real mother of *Kṛīṣṇā*.

(2) The foster-mother of *Kṛīṣṇā*.

(3) *Rōṣkmiēnī* the consort of *Kṛīṣṇā*. She is here called *Lākshmi*, in compliance with the idea of her being a descent of that Goddess.

(4) This is neither the conqueror of *Ceylon*, nor the brother of *Kṛīṣṇā*.

of paying due praise to the virtues of great men, and who believe in the purity of *Astrology*.

## XXI.

In him was united a lovely pair, *Lakshmi* and *Saraswati*, the disposer of fortune, and the Goddesses of Science, who seemed to have forsaken their natural enmity, and to stand together pointing at friendship.

## XXII.

He laughed to scorn him who, in the assemblies of the learned, was intoxicated with the love of argument, and confounded him with profound and elegant discourses framed according to the doctrine of the *Sāstrās*; and he spared not the man who, because of his boundless power and riches, was overwhelmed with the pride of victory over his enemy in the field.

## XXIII.

He had a womb, but it obstinately bore him no fruit. One like him can have no great relish for the enjoyments of life! He never was blessed with that giver of delight, by obtaining which a man goeth unto another almoner, (1.)

(1) He had no issue to perform the *Sādā* for the release of his soul from the bonds of sin. By another almoner is meant the Deity.

## XXIV.

He, who was, as it were, another *Vālmīkī*,<sup>(1)</sup> born in this dark age of impiety, amongst a dreadful and a cruel race of mortals, was a devout man, who displayed the learning of the *Vēds* in books of moral tales.

## XXV.

His profound and pleasing language, like *Gāṅgā*, flowing in a triple course (2) and constant stream, purifieth and delighteth.

## XXVI.

He, to whom, and to those of whose generation, men were wont to resort as it were to *Bṛāhmā*, waited so long in expectation of being a father, that, at length, he himself arrived at the state of a child.

## XXVII.

By him was recorded here upon this lasting column, the superior beauty of whose shaft catcheth the eye of the beholder, whose aspiring height is as boundless as his own ideas, which is, as it were, a stake planted in the breast of *Kālēē*, (3,) and on whose top sits *Tārshyā*, (4,) the foe of serpents, and favourite bird of *Haree*, the line of his own descent.

(1) The first poet of the Hindoos, and supposed author of the *Rāmāyaṇ*.

(2) He is supposed to have written in three languages.

(3) Time.

(4) Otherwise called *Gārūr*.

## XXVIII.

*Gärbör*, like his fame, having wandered to the extremity of the world, and descended even unto its foundation, was exalted here with a serpent in his mouth.

This work was executed by the artist *Běëndöš Bhàdrá*.

## REMARKS ON THE TWO PRECEDING PAPERS.

BY THE PRESIDENT.

NO man has greater respect than myself for the talents of Mr. WILKINS, who, by decyphering and explaining the old *Sanscrit* inscriptions lately found in these provinces, has performed more than any other *European* had learning enough to accomplish, or than any *Asian* had industry enough even to undertake. but some doubts having arisen in my mind concerning a few passages in the two preceding translations, I venture to propose them in the form of notes with entire deference to his judgment.

P. 123. l. 11. *This fortunate Prince*—Is not the first couplet in honour of BUDDHA, one of whose names, in the *Amarôṣṭh*, is SUGATA? A follower of his tenets would have been denominated a *Sangat*, in the derivative form. We must observe, that the *Bauddhs*, or *Sangats*, are called *Attreists* by the *Brabmans*, whom they opposed; but it is mere invective; and this very grant fully disproves the calumny, by admitting a future state of rewards and punishments. SUGAT was a reformer; and every reformer must expect to be calumniated.

P. 123. l. 18. *When his innumerable army*—The third stanza in the original is here omitted, either by an oversight, or because the same image of *weeping elephants* occurs afterwards, and might have been thought superfluous in this place: nevertheless, I insert a literal translation of it.

“By whom, having conquered the earth as far as the ocean, it was left, as being unprofitably seized; so he declared: and his elephants weeping saw again in the forests their kindred, whose eyes were full of tears.”

P. 124. l. 18. *Of many countries*—The *Pandits* insist that *Râṣṭracûta*, in the original, is the name of a particular country.

P. 127. l. 18. *Dated in the 33d Sombot*—That is, year; for *Samvat* is only an abbreviation of *Samvatṣava*. This date, therefore, might only mean the thirty-third year of the King's reign; but, since VICRAMADITYA was surnamed the foe of SACA, and is praised by that name in a preceding stanza, we may safely infer, that the grant was dated thirty-three years after the death of that illustrious Emperor, whom the king of Gaur, though a sovereign prince, acknowledged as lord paramount of India.

P. 133. Verse II. *A virtuous prince*—Many stanzas in this inscription prove, that the *Sândilya* family were not *princes*, but that some of them were prime ministers to the kings of Gaur, or Bengal, according to this comparative genealogy:

Kings.	Ministers*.
GO'PALA.	PANCHA'LA.
DHEKMAPALA.	GARGA.
DEVAPALA. B. C. 23.	* DERBHAPA'NI.
RA'JYAPA'LA.	SOME'SWARA.
S'URAPA'LA.	* CEDA'RAMIS'RA.
NARA'YANAPA'LA. A. C. 67.	* GURAVAMIS'RA.

So that, reckoning thirty years to a generation, we may date the Pillar of GURAYAMIS'RA in the sixty-seventh year after CHRIST. A *Pandit*, named RA'DHA'CA'NTA, with whom I read the original, appeared struck with my remark on the two families, and adopted it without hesitation; but if it be just, the second stanza must be differently interpreted. I suspect *Dharma*, the Genius of *Justice* or *Virtue*, to be the true reading, instead of *Dharmya*, or *virtuous*; and have no doubt that *paró* must be substituted for *paró*: the sense will then be, that INDRA was ruler in the East only, and, though valiant, had been defeated even there by the *Daiyas* or *Titans*, but that DHARMA was made sovereign over him in all quarters.

P. 134. Verse V. *Whose country*—The original is:

à révájanacáñmatañgajamadañtímyachich'hiláñfanghaté,  
 à gauripituriswaréñdraciranaihpushyatñimnógírch,  
 mártan'dáñtamayódayárun'ajalád á váríráñsidwayát,  
 nityà yasya bhuwañ chacára caradán sñí dévapáñd nñipahi,

The father of *Réva* is the *Mahéñdra* mountain in the south, in which that river has its source; as the father of *Gauri* is the *Himálaya* in the north, where *Iswara*, who has a *moon* on his forehead, is believed often to reside: hence RA'DHA'CA'NTA proposed a conjectural emendation, which would have done honour to SCALIGER or BENTLEY. Instead of *india*, which is a name of the *sun*, he reads *india*, or the *moon*, by changing only a small straight line into a small curve; and then the stanza will run thus:

By whose policy the great Prince D'VAPATA made the earth tributary, from the father of *Réva*, whose piles-of-rocks-are-moist-with-juice-from-the-heads-of-lascivious-elephants, to the father-of-GAURI, whose white-mountains-are-brightened with-beams-from-the-moon-of-Iswara, and as far as the two-oceans whose waters-are-red-with-the-rising-and-with-the-setting-Sun.

The words connected by hyphens are compounds in *Sanskrit*.

P. 135. Verse VI. *Submission*—I understand *avafana* in this place to mean the *lesure* of the minister from public affairs, for which even the king waited at the head of his army.

P. 135. Verse VII. *Sums of Pēñāñ*—The common sense of *pa'ñha* is a *chair*, *seat*, or *throne*; and in this sense it occurs in the thirteenth verse. *Ud upaché 'Lalipñ 'ham*, or *so-b-a-seat-as-bright-as-the-moon*, appears to be the compound epithet of *áñnam*, or *chan of state* which though the king had often given to his minister, yet, abashed by his wisdom, and apprehensive of his popularity, he had himself ascended his throne with fear.

P. 136. Verse X. The tenth stanza is extremely difficult, as it contains many words with two meanings, applied in one sense to the Minister CH'ARA MIS'RA, but, in another, to CA'KIC'YA, the *Indian Mars*: thus, in the first hemistich, *śich'hu* means *fire*, or a *flame*, or *light*, or *flame*, or a *crest*; and *śaché*, either *power* or a *specie*. As the verse is difficultly understood, it may be a description of the *Bráhmens* or of the *Deity*.

P. 136. Verse XII. The *Bráhmens* of this province insist, that by the four *Vidyá's*, or branches of knowledge, are meant the four *Véda's*, not the *Upanisháds*, or *Meditations*, *Yogas*, *Magick*, and *Mysticisms*; and they cite two distichs from the *Atishayáñ*, in which *śich'hu* is enumerated, and

among them the *four Vēdas*; three only of which are mentioned in the *Amaras*, and in several older books. In this verse also RA'DHA'CA'NT has displayed his critical sagacity: instead of *nāla* he reads *bāla*; and, if his conjecture be right, we must add, "*even when he was a boy.*"

P. 137. Verse XVI. *Constant to her lord*—RA'DHA'CA'NT reads *anapātayā*, or *childless*, for *anapātayā*; SATI' having borne no children till she became regenerate in the person of PĀRVATĪ'.

P. 139. Verse XXIII. *It obstinately bore him no fruit*—The original stanza is uncommonly obscure: it begins with the words *jānurbabbūva*, the two first syllables of which certainly mean *a womb*; but several *Pandits*, who were consulted apart, are of opinion, that *jā* is the relative, of which some word in the masculine gender, signifying *speech*, is the antecedent, though not expressed: they explain the whole stanza thus—"That speech, which came forth (*nurbabbūva*) inconsiderately, of which *thou* was no fruit, *he was a man* who spoke nothing of that kind for his own gratification: *he was a man* also, by whom no present-of-playthings was ever given, which the suppliant having received "goes to another more beautiful giver." If the relative had been *jan* in the neuter gender, I should have acquiesced in the translation offered by the *Pandits*; but the suppression of so material a word as *speech*, which, indeed, is commonly *feminine* in *Sanskrit*, appears unwarrantably harsh according to European ideas of construction.

P. 140. Verse XXVI. If the preceding interpretation be just, the object of the pillar was to perpetuate the names of GURAVA MISRA and his ancestors; and this verse must imply, that *he expected to receive from his own sons the pious offices which he had performed to his forefathers.*

## V.

SOME ACCOUNT OF THE  
 SCULPTURES AND RUINS AT MAVALIPURAM,  
 A PLACE A FEW MILES NORTH OF SADRAS, AND KNOWN TO SEAMEN BY THE  
 NAME OF THE SEVEN PAGODAS.

By WILLIAM CHAMBERS, Esq.

AS amidst inquiries after the histories and antiquities of *Asia* at large, those of that division of it in which this society resides, may seem on many accounts to lay claim to a particular share of its attention, a few hints put down from recollection, concerning some monuments of *Hindoo* antiquity, which, though situated in the neighbourhood of *European* settlements on the *Choromandel* coast, have hitherto been little observed, may it is conceived, be acceptable, at least as they may possibly give rise hereafter to more accurate observations, and more complete discoveries on the same subject. The writer of this account went first to view them in the year 1772, and curiosity led him thither again in 1776; but as he neither measured the distances nor size of the objects, nor committed to writing at the time the observations he made on them, he hopes to be excused if, after the lapse of so many years, his recollection should fail him in some respects, and his account fall far short of that precision and exactness, which might have been expected, had there then existed in *India* so powerful an incentive to diligent inquiry, and accurate communication, as the establishment of this society must now prove.

The monuments he means to describe, appear to be the remains of



some great city, that has been ruined many centuries ago; they are situated close to the sea, between *Covelong* and *Sadras*, somewhat remote from the high road, that leads to the different *European* settlements. And when he visited them in 1776, there was still a native village adjoining to them, which retained the ancient name, and in which a number of *Bramins* resided, that seemed perfectly well acquainted with the subjects of most of the sculptures to be seen there.

The rock, or rather hill of stone, on which great part of these works are executed, is one of the principal marks for mariners as they approach the coast, and to them the place is known by the name of the *Seven Pagados*, possibly because the summits of the rock have presented them with that idea as they passed: but it must be confessed, that no aspect which the hill assumes, as viewed on the shore, seems at all to authorize this notion; and there are circumstances, which will be mentioned in the sequel, that would lead one to suspect, that this name has arisen from some such number of Pagados that formerly stood here, and in time have been buried in the waves. But, be that as it may, the appellation by which the natives distinguish it, is of a quite different origin: in their language, which is the *Tamulic*, (improperly termed *Malabar*,) the place is called *Māvalipuram*, which, in *Shanscrit*, and the languages of the more northern *Hindoos*, would be *Mahābalipūr*, or the *City of the great Bali*. For the *Tamulians*, (or *Malabars*,) having no *h* in their alphabet, are under a necessity of shortening the *Shanscrit* word *mahā*, great, and write it *mā*\*. They are obliged also, for a similar reason, to substitute a *v* for a *b*, in words of *Shanscrit*, or other foreign original that begin with that letter; and the syllable *am*, at the end, is merely a termination, which, like *um* in *Latin*, is generally annexed

\* They do indeed admit a substitute, but the abbreviation is most used.

to neuter substances\*. To this etymology of the name of this place it may be proper to add, that *Bālī* is the name of a hero very famous in *Hindoo* romance; and that the river *Māvaligonga*, which waters the eastern side of *Ceylone*, where the *Tamulic* language also prevails, has probably taken its name from him, as, according to that orthography, it apparently signifies the *Ganges* of the great *Bālī*.

The rock, or hill of stone, above mentioned, is that which first engrosses the attention on approaching the place; for, as it rises abruptly out of a level plain of great extent, consists chiefly of one single stone, and is situated very near to the sea beach, it is such a kind of object as an inquisitive traveller would naturally turn aside to examine. Its shape is also singular and romantic, and, from a distant view, has an appearance like some antique and lofty edifice. On coming near to the foot of the rock from the north, works of imagery† and sculpture crowd so thick upon the eye, as might seem to favour the idea of a petrified town, like those that have been fabled in different parts of the world by too credulous travellers‡. Proceeding on by the foot of the hill, on the side facing the sea, there is a pagoda rising out of the ground, of one solid stone, about sixteen or eighteen feet high, which seems to have been cut upon the spot out of a detached rock, that has been found of a proper size for that purpose.

\* This explains also, why the *Sanscrit* word *Vēd*, by which the *Hindoo*s denominate the books of the law of their religion, is written by the *Tamulians* *Vēdam*, which is according to the true orthography of their language, and no mistake of *European* travellers, as some have supposed; while the same word is called *Bēd* by the *Bengalies*, who have in effect no *V* in their alphabet.—See Dow, Vol. I. Dissert. P. 41.

† Among these, one object, though a mean one, attracts the attention, on account of the grotesque and ridiculous nature of the design; it consists of two monkeys cut out of one stone, one of them in a stooping posture, while the other is taking the insects out of his head.

1 See SHAW'S Travels, P. 155, et seq.

The top is arched, and the style of architecture, according to which it is formed, different from any now used in those parts. A little further on, there appears upon an huge surface of stone, that juts out a little from the side of the hill, a numerous group of human figures in bas relief, considerably larger than life, representing the most remarkable persons, whose actions are celebrated in the *Mahābhārit*, each of them in an attitude, or with weapons or other insignia, expressive of his character, or of some one of his most famous exploits. All these figures are, doubtless, much less distinct than they were at first; for, upon comparing these and the rest of the sculptures that are exposed to the sea air, with others at the same place, whose situation has afforded them protection from that element, the difference is striking; the former being every where much defaced, while the others are fresh as recently finished. This defacement is no where more observable, than in the piece of sculpture which occurs next in the order of description. This is an excavation in another part of the east side of the great rock, which appears to have been made on the same plan, and for the same purpose that Chowtries are usually built in that country; that is to say, for the accommodation of travellers. The rock is hollowed out to the size of a spacious room, and two or three rows of pillars are left, as a seeming support to the mountainous mass of stone which forms the roof. Of what pattern these pillars have originally been, it is not easy now to conjecture; for the air of the sea has greatly corroded them, as well as all the other parts of the cave. And this circumstance renders it difficult to discover, at first sight, that there is a scene of sculpture on the side fronting the entrance. The natives, however, point it out, and the subject of it is manifestly that of *Krishen* attending the herds of *Nund Ghose*, the *Admetus* of the *Hindoos*; from which circumstance, *Krishen* is also called *Gopaul*, or the cowherd, as *Apollo* was entitled *Nomius*.

The

The objects which seem next to claim regard, are those upon the hill itself, the ascent of which, on the north, is, from its natural shape, gradual and easy at first, and is in other parts rendered more so, by very excellent steps cut out in several places, where the communication would be difficult or impracticable without them. A winding stair of this sort leads to a kind of temple cut out of the solid rock, with some figures of idols in high relief upon its walls, very well finished, and perfectly fresh, as it faces the west, and is therefore sheltered from the sea air. From this temple again there are flights of steps, that seem to have led to some edifice, formerly standing upon the hill; nor does it seem absurd to suppose, that this may have been a palace, to which this temple, as a place of worship, may have appertained. For, besides the small detached ranges of stairs that are here and there cut in the rock, and seem as if they had once led to different parts of one great building, there appear in many places, small water channels cut also in the rock, as if for drains to an house; and the whole top of the hill is strewed with small round pieces of brick, which may be supposed, from their appearance, to have been worn down to their present form, during the lapse of many ages. On ascending the hill by its slope on the north, a very singular piece of sculpture presents itself to view. On a plain surface of the rock, which may once have served as the floor of some apartment, there is a platform of stone, about eight or nine feet long, by three or four wide, in a situation rather elevated, with two or three steps leading up to it, perfectly resembling a couch or bed, and a lion very well executed at the upper end of it by way of pillow, the whole of one piece, being part of the hill itself. This the *Bramins*, inhabitants of the place, call *the bed of Dhermarajah*, or *Judishter*, the eldest of the five brothers, whose fortunes and exploits are the leading subject in the *Mahabharit*. And at a considerable distance from this, at such a distance, indeed, as the apartment

apartment of the women might be supposed to be from that of the men, is a bath excavated also from the solid rock, with steps in the inside, which the *Bramins* call the bath of *Dropeety*, the wife of *Judishter* and his brothers. How much credit is due to this tradition, and whether this stone couch may not have been antiently used as a kind of throne rather than a bed, is matter for future inquiry. A circumstance, however, which may, seem to favour this idea is, that a throne in the *Shanscrit*, and other *Hindoo* languages, is called *Singhâsen*, which is composed of the words *Sing*, a lion; and *âsen*, a seat.

These are all that appear on that part of the upper surface of the hill, the ascent to which is on the north; but, on descending from thence, you are led round the hill to the opposite side, in which there are steps cut from the bottom to a place near the summit, where is an excavation that seems to have been intended for a place of worship, and contains various sculptures of *Hindoo* Deities. The most remarkable of these, is a gigantic figure of *Vishnoo*, asleep on a kind of bed, with a huge snake wound about in many coils by way of pillow for his head; and these figures, according to the manner of this place, are all of one piece, hewn from the body of the rock.

But though these works may be deemed stupendous, they are surpassed by others that are to be seen at the distance of about a mile, or a mile and an half, to the southward of the hill. They consist of two Pagodas, of about thirty feet long by twenty feet wide, and about as many in height, cut out of the solid rock, and each consisting originally of one single stone. Near these also stand an elephant full as big as life, and a lion much larger than the natural size, but very well executed, each hewn also out of one stone.

stone. None of the pieces that have fallen off in cutting these extraordinary sculptures, are now to be found near or any where in the neighbourhood of them, so that there is no means of ascertaining the degree of labour and time that has been spent upon them, nor the size of the rock or rocks from which they have been hewn, a circumstance which renders their appearance the more striking and singular. And though their situation is very near the sea-beach, they have not suffered at all by the corrosive air of that element, which has provided them with a defence against itself, by throwing up before them a high bank, that completely shelters them. There is also great symmetry in their form; though that of the Pagodas is different from the style of architecture, according to which idol temples are now built in that country. The latter resembles the *Egyptian*; for the towers are always pyramidal, and the gates and roofs flat, and without arches; but these sculptures approach nearer to the *Gothic* taste, being surmounted by arched roofs or domes, that are not semicircular, but composed of two segments of circles meeting in a point at top. It is also observable that the lion in this group of sculptures, as well as that upon the stone couch above mentioned, are perfectly just representations of the true lion; and the natives there give them the name, which is always understood to mean a lion in the *Hindoo* language, to wit, *Sing*; but the figure, which they have made to represent that animal in their idol temples for centuries past, though it bears the same appellation, is a distorted monster, totally unlike the original; inasmuch that it has from hence been supposed that the lion was not antiently known in this country, and that *Sing* was a name given to a monster that existed only in *Hindoo* romance. But it is plain that that animal was well known to the authors of these works, who, in manners as well as arts, seem to have differed much from the modern *Hindoos*.

There

There are two circumstances attending these monuments, which cannot but excite great curiosity, and on which future inquiries may possibly throw some light. One is, that, on one of the Pagodas last mentioned, there is an inscription of a single line, in a character at present unknown to the *Hindoos*. It resembles neither the *Deyva-nâgre*, nor any of the various characters connected with or derived from it, which have come to the writer's knowledge from any part of *Hindostan*. Nor did it, at the time he viewed it, appear to correspond with any character, *Asiatick* or *European*, that is commonly known. He had not then, however, seen the alphabet of the *Balic*, the learned language of the *Siamese*, a sight of which has since raised in his mind a suspicion, that there is a near affinity between them, if the character be not identically the same. But as these conjectures, after such a lapse of time, are somewhat vague, and the subject of them is perhaps yet within the reach of our researches, it is to be hoped that some method may be fallen upon of procuring an exact copy of this inscription.

The other circumstance is, that though the outward form of the Pagodas is complete, the ultimate design of them has manifestly not been accomplished, but seems to have been defeated by some extraordinary convulsion of nature. For the western side of the most northerly one, is excavated to the depth of four or five feet, and a row of pillars left on the outside to support the roof; but here the work has been stopped, and an uniform rent of about four inches breadth has been made throughout the solid rock, and appears to extend to its foundations, which are probably at a prodigious depth below the surface of the ground. That this rent has happened since the work begun, or while it was carrying on, cannot be doubted; for the marks of the mason's tools are perfectly visible in the  
excavated

excavated part on both sides of the rent, in such a manner as to show plainly that they have been divided by it. Nor is it reasonable to suppose that such a work would ever have been designed, or begun, upon a rock that had previously been rent in two.

Nothing less than an earthquake, and that a violent one, could apparently have produced such a fissure in the solid rock: and that this has been the case in point of fact, may be gathered from other circumstances, which it is necessary to mention in an account of this curious place.

The great rock above described is at some small distance from the sea, perhaps fifty or an hundred yards, and in that space the *Hindoo* village before mentioned stood in 1776. But close to the sea are the remains of a Pagoda, built of brick, and dedicated to *Sib*, the greatest part of which has evidently been swallowed up by that element; for the door of the innermost apartment, in which the idol is placed, and before which there are always two or three spacious courts surrounded with walls, is now washed by the waves; and the pillar used to discover the meridian at the time of founding the Pagoda\* is seen standing at some distance in the sea. In the neighbourhood of this building there are some detached rocks, washed also by the waves, on which there appear sculptures, though now much worn and defaced. And the natives of the place declared to the writer of this account, that the more aged people among them remembered to have seen the tops of several Pagodas far out in the sea, which being covered with copper (probably gilt) were particularly visible at sun rise, as their shining surface used then to reflect the sun's rays, but

\* See Voyage du M. Gentil, Vol. I. Page 159.



that now that effect was no longer produced, as the copper had since become incruſted with mould and verdgreafe.

Theſe circumſtances look much like the effects of a ſudden inundation; and the rent in the rock above deſcribed makes it reaſonable to conjecture, that an earthquake may have cauſed the ſea to overflow its boundaries, and that theſe two formidable enemies may have joined to deſtroy this once magnificent city. The account which the *Bramins*, natives of the place, gave of its origin and downfall, partly, it ſhould ſeem, on the authority of the *Mahabhárit*, and partly on that of later records, at the ſame time that it countenances this idea, contains ſome other curious particulars, which may ſeem to render it worthy of attention. Nor ought it to be rejected on account of that fabulous garb, in which all nations, but eſpecially thoſe of the caſt, have always clad the events of early ages.

“ *Hirinácheren* (ſaid they) was a gigantick prince, that rolled up  
 “ the earth into a ſhapeleſs maſs, and carried it down to the abyſs, whi-  
 “ ther *Viſhnoo* followed him in the ſhape of an hog, killed him with his  
 “ tuſks, and replaced the earth in its original ſituation. The younger  
 “ brother of *Hirinácheren* was *Hirinakassap*, who ſucceeded him in his  
 “ kingdom, and refuſed to do homage to *Viſhnoo*. He had a ſon named  
 “ *Pralhaud*, who at an early age openly diſapproved this part of his fa-  
 “ ther’s conduct, being under the tuition of *Sokerácharj*. His father per-  
 “ ſecuted him on this account, baniſhed him, and even fought to kill him,  
 “ but was prevented by the interpoſition of heaven, which appeared on  
 “ the ſide of *Pralhaud*. At length *Hirinakassap* was ſoftened, and recall-  
 “ ed his ſon to his court, where, as he ſat in full aſſembly, he began again  
 “ to argue with him againſt the ſupremacy of *Viſhnoo*, ſtaſted that he  
 “ himſelf

“ himself was lord of all the visible world, and asked what *Vishnoo* could pretend to more. *Pralhaud* replied, that *Vishnoo* had no fixed abode, but was present every where. Is he, said his father, in that pillar? Yes, returned *Pralhaud*. Then let him come forth, said *Hirinakassap*; and, rising from his seat, struck the pillar with his foot; upon which *Vishnoo*, in the *Narasingah Awtar*, that is to say, with a body like a man, but an head like a lion, came out of the pillar, and tore *Hirinakassap* in pieces. *Vishnoo* then fixed *Pralhaud* on his father's throne; and his reign was a mild and virtuous one, and as such was a contrast to that of his father. He left a son named *Namachee*, who inherited his power and his virtues, and was the father of *Balee*, the founder of the once magnificent city of *Mahabalipoor*, the situation of which is said to be described in the following verse, taken from the *Mahabharat*.

• गङ्गायाः दक्षिणेतरे योजनानां शतद्वयम्—  
 पञ्चयोजन यात्रो पूर्वार्वाविश्वं पश्चिमे—

The sense of which is literally this :

“ South of the *Ganges* two hundred Yojen  
 “ Five Yojen\* westward from the eastern sea.

Such is the *Bramin* account of the origin of this place. The sequel of its history, according to them, is as follows :

\* The *Yojen* is a measure often mentioned in the *Sanscrit* books, and, according to some accounts, is equal to nine, according to others twelve *English* miles. But at that rate the distance here mentioned, between this place and the *Ganges*, is prodigiously exaggerated, and will carry us far south of *Ceylon*. This, however, is not surprising in an *Hindoo* poem; but, from the second line it seems pretty clear, that this city, at the time this verse was composed, must have stood at a great distance from the sea.

" The son of *Balce* was *Banácheren*, who is represented as a giant  
 " with a thousand hands. *Anuredh*, the son of *Krishen*, came to his court  
 " in disguise, and seduced his daughter; which produced a war, in the  
 " course of which *Anuredh* was taken prisoner, and brought to *Mahábali-*  
 " *poor*; upon which *Krishen* came in person from his capital *Duárikah*,  
 " and laid siege to the place. *Sib* guarded the gates, and fought for *Ba-*  
 " *nácheren*, who worshipped him with his thousand hands; but *Krishen*  
 " found means to overthrow *Sib*, and having taken the city, cut off all *Ba-*  
 " *nácheren's* hands, except two, with which he obliged him to do him  
 " homage. He continued in subjection to *Krishen* till his death; after  
 " which a long period ensued, in which no mention is any where made of  
 " this place, till a prince arose, whose name was *Malécheren*, who restored  
 " the kingdom to great splendour, and enlarged and beautified the capital.  
 " But in his time the calamity is said to have happened by which the city  
 " was entirely destroyed; and the cause and manner of it have been wrapt  
 " up by the *Bramins* in the following fabulous narration. *Malécheren*,  
 " (say they,) in an excursion which he made one day alone, and in disguise,  
 " came to a garden in the environs of the city, where was a fountain so  
 " inviting, that two celestial nymphs had come down to bathe there. The  
 " *Rajah* became enamoured of one of them, who condescended to allow  
 " of his attachment to her; and she and her sister nymph used thencefor-  
 " ward to have frequent interviews with him in that garden." On one of  
 " those occasions, they brought with them a male inhabitant of the hea-  
 " venly regions, to whom they introduced the *Rajah*; and between him  
 " and *Malécheren* a strict friendship ensued; in consequence of which he  
 " agreed, at the *Rajah's* earnest request, to carry him in disguise to see the  
 " court of the divine *Inder*, a favour never before granted to any mortal.  
 " The *Rajah* returned from thence with new ideas of splendour and mag-  
 nificence,

“ nificence, which he immediately adopted in regulating his court, and  
 “ his retinue, and in beautifying his seat of government. By this means  
 “ *Mahábalipoor* became soon celebrated beyond all the cities of the earth;  
 “ and an account of its magnificence having been brought to the gods  
 “ assembled at the court of *Inder*, their jealousy was so much excited at it,  
 “ that they sent orders to the God of the Sea to let loose his billows, and  
 “ overflow a place which impiously pretended to vie in splendour with  
 “ their celestial mansions. This command he obeyed, and the city was at  
 “ once overflowed by that furious element, nor has it ever since been able  
 “ to rear its head.”

Such is the mode in which the *Bramins* chuse to account for the signal overthrow of a place devoted to their wretched superstitions.

It is not, however, improbable, that the rest of this history may contain, like the mythology of *Greece* and *Rome*, a great deal of real matter of fact, though enveloped in dark and figurative representations. Through the disguise of these we may discern some imperfect records of great events, and of revolutions that have happened in remote times, and they perhaps merit our attention the more, as it is not likely that any records of ancient *Hindoo* history exist but in this obscure and fantastic dress. Their poets seem to have been their only historians, as well as divines; and whatever they relate, is wrapped up in this burlesque garb, set off, by way of ornament, with circumstances hugely incredible and absurd, and all this without any date, and in no other order or method, than such as the poet's fancy suggested, and found most convenient. Nevertheless, by comparing names and grand events, recorded by them, with those interspersed in the histories of other nations, and by calling in the assistance

affluence of ancient monuments, coins, and inscriptions, as occasion shall offer, some probable conjectures, at least, if not important discoveries, may, it is hoped, be made on these interesting subjects. It is much to be regretted, that a blind zeal, attended with a total want of curiosity, in the *Mohammedan* governors of this country, have been so hostile to the preservation of *Hindoo* monuments and coins. But a spirit of inquiry among *Europeans* may yet perhaps be successful; and an instance, which relates to the place above described, though in itself a subject of regret, leaves room to hope that futurity may yet have in store some useful discoveries. The *Kauzy* of *Madras*, who had often occasion to go to a place in the neighbourhood of *Mahabalipoor*, assured the writer of this account, that within his remembrance a ryot of those parts had found, in plowing his ground, a pot of gold and silver coins, with characters on them which no one in those parts, *Hindoo* or *Mohammedan*, was able to decypher. He added, however, that all search for them would now be vain, for they had doubtless been long ago devoted to the crucible, as, in their original form, no one there thought them of any value.

The inscription on the Pagoda mentioned above, is an object which, in this point of view, appears to merit great attention. That the conjecture, however, which places it among the languages of *Siam*, may not seem in itself chimerical, the following passages from some authors of repute are here inserted, to show, that the idea of a communication having formerly subsisted between that country and the coast of *Choromandel*, is by no means without foundation; nay, that there is some affinity, even at this day, between the *Balic* and some of the *Hindoo* languages: and that the same mode of worship seems formerly to have prevailed in the *Deccan*, which is now used by the *Siamese*.

MONSIEUR DE LA LOUBERE, in his excellent account of *Siam*, speaks thus of the origin of the *Balic* language.

"The Siamese, says he, do not mention any country where the Balic language, which is that of their laws and their religion, is at present in use. They suppose, indeed, on the report of some among them, who have been on the coast of Choromandel, that it bears some resemblance to some of the dialects of that country; but they at the same time allow, that the character in which it is written is not known but among themselves. The secular Missionaries settled at Siam believe that this language is not entirely a dead one; because they have seen in their hospital a man from the neighbourhood of Cape Comorin, who mixed several Balic words in his discourse, declaring that they were in use in his country, and that he himself had never studied nor knew any other than his mother tongue. They at the same time mention, as matter of certainty, that the religion of the Siamese comes from those parts; as they have read in a Balic book that Sommonacodom, the idol of the Siamese, was the son of a King of Ceylone\*."

\* "Les Siamois ne nomment aucun Pais, ou la langue Bali qui est celle de leurs loix et de leur religion, soit aujourd'hui en usage. Ils soupçonnent à la vérité, sur le rapport de quelques-uns d'entre eux, qui ont été à la côte de Coromandel, que la langue Balic a quelque ressemblance avec quelque un des dialectes de ce pays-là : mais ils conviennent en même temps que les lettres de la langue Balic ne sont connues que chez eux. Les Missionnaires séculiers à Siam croient que cette langue n'est pas entièrement morte; parce qu'ils ont vu dans leur hôpital un homme des environs du Cap de Comorin, qui mêloit plusieurs mots Balis dans son langage, assurant qu'ils étoient en usage en son pays, et que lui n'avoit jamais étudié, et ne savoit que la langue maternelle. Ils donnent d'ailleurs pour certain que la religion des Siamois vient de ces quartiers-là, parce qu'ils ont lu dans un livre Balic que Sommonacodom que les Siamois adorent, étoit fils d'un Roy du l'île de Ceylone."

The

The language of the man mentioned in this passage, who came from the neighbourhood of *Cape Comorin*, could be no other than the *Tamulic*; but the words here alluded to may very possibly have been derivatives from the *Shanscrit*, common to both that and the *Balic*.

In another part of the same work, where the author treats of the history of *Sommonacodom* at large, on the authority of the *Balic* books, he says :

“ The father of *Sommonacodom*, according to the same *Balic* book, was a King of *Teve Lanca*, that is to say of the famous *Ceylone*\*.”

Here it is observable, that, while the country of *Siam* seems to be utterly unknown, both to the natives of *Ceylone* and *Hindustan*, *Ceylone*, should nevertheless be so well known to the *Siamese*, and under the same appellation it bears in the *Shanscrit*. An epithet is also here prefixed to it, which seems to be the same as that used by the *Hindoos* in speaking of that island; for they also call it, in *Shanscrit*, *Déve Lanca*, or the *Sacred Lanca*. From several passages in the same work it also appears, that the *Shanscrit* word *Mahá*, which signifies *great*, is constantly used in the *Balic* language in the same sense. And the names of the days of the week are most of them the same in *Shanscrit* and in *Balic*, as may be seen in the following comparison of them.

*Shanscrit.*

Aditta-vâr,

*Balic.*

Van Athit,

Sunday,

\* “ Le pere de *Sommonacodom* étoit, selon ce même livre *Bali*, un Roy de *Teve Lanca*, c’est à dire un Roy de la celebre *Ceylan*.”

*Shanscrit.*

<i>Shanscrit.</i>	<i>Balic.</i>	
Soma-vâr,	Van* Tchân,	Monday.
Mungela-vâr,	Van Angkaan,	Tuesday.
Bouta-vâr,	Van Pout,	Wednesday.
Brahspati-vâr,	Van Prahout,	Thursday.
Soucra-vâr,	Van Souc,	Friday.
Sany-vâr,	Van Sãoa,	Saturday.

The same author gives, in another place, an account of a pretended print of a foot on a rock, which is an object of worship to the *Siamese*, and is called *Prabât*, or the venerable foot. For *prâ*, in *Balic*, he says, signifies *venerable*, which agrees with *prâper* and *pramesht* in *Shanscrit*; and *bât* in the same tongue is a foot, as *pâd* in *Shanscrit*. After which he goes on to say :

“ We know that in the island of Ceylone, there is a pretended print of a human foot, which has long been held in great veneration. It represents, doubtless, the left foot; for the Siamese say that Sommonacodom set his right foot on their *Prabât*, and his left foot at Lanca † ”

From KNOX's History of *Ceylone* it appears, that the impression here spoken of is upon the hill called, by the *Chingelays*, *Hamalell*; by *Europeans*, *Adam's Peak*; and that the natives believe it to be the foot-step of their

\* Here one *Hindoo* word is substituted for another; for *Tchân* in *Hindoostany*, and *Tchänder* in *Shanscrit*, signify the moon as well as *Soma*.

† “ On fait que dans l'île de Ceylan, il y a un prétendu vestige de pié humain, que depuis long temps y est en grande veneration. Il représente sans doute le pié gauche; car les Siamois disent que Sommonacodom posa le pié droit a leur *prabat*, et le pié gauche a Lanca, ”



great idol *Buddou*; between the worship of whom, as described by KNOX, and that of *Sommonacodom*, as related by M. DE LA LOUBERE, there is a striking resemblance in many particulars, which it may be proper here to enumerate.

1<sup>st</sup>. Besides the foot-steps above mentioned, there is a kind of tree (which, from description, appears to be the *Pipel* tree, so well known in *India*) which the *Chingelays* hold sacred to *Buddou*, and the *Siamese* to *Sommonacodom*; infomuch that the latter deem it meritorious to hang themselves upon it. The *Chingelays* call it *Bogahah*; for *gahah*, in their language, signifies a tree; and *bo* seems to be an abbreviation of *Bod* or *Buddou*; and the *Siamese* call it, in *Balic*, *Pra si Maha Pout*, which, according to DE LA LOUBERE's interpretation, signifies the tree of the great *Pout*\*. This he supposes to mean *Mercury*; for he observes that *Pout*, or *Poot*, is the name of that planet in the *Balic* term for *Wednesday*; and in another place, he says, *Pout* is one of the names of *Sommonacodom*. It is certain that *Wednesday* is called the name of *Bod*, or *Budd*, in all the *Hindoo* languages, among which the *Tamulic*, having no *b*, begins the word with a *p*, which brings it very near the *Balic* mode of writing it. It is equally certain that the days of the week, in all these languages, are called after the planets in the same order as with us; and that *Bod*, *Budd*, or *Pood*, holds the place of *Mercury*. From all which it should appear that *Pout*, which, among the *Siamese*, is another name for *Sommonacodom*, is itself a corruption of *Buddou*, who is the *Mercury* of the *Greeks*. And it is singular that, according to M. DE LA LOUBERE, the mother of *Sommonacodom* is called, in *Balic*, *Maha-mania*, or the great *Mania*, which resembles much the

\* In vulgar *Siamese* they call it *Tou-pé*.

name of *Maia*, the mother of *Mercury*. At the same time that the *Tamulic* termination *en*, which renders the word *Pooden*, creates a resemblance between this and the *Hoden* of the *Gothic* nations, from which the same day of the week is denominated, and which, on that and other accounts, is allowed to be the *Mercury* of the *Greeks*.

2dly. The temples of *Sommonacodom* are called *Pihân*; and round them are habitations for the priests, resembling a college; so those of *Boddou* are called *Vihâr*, and the principal priests live in them as in a college. The word *Vihâr*, or, as the natives of *Bengal* would write it, *Bihâr*, is *Shanscrit*; and *FRISHTAN*, in his *History of Bengal*, says, that this name was given by the *Hindoos* to the Province of *Behâr*, because it was formerly so full of *Brahmins*, as to be, as it were, one great *seminary of Learning*, as the word imports.

3dly. The *Siamese* have two orders of priests, and so have the worshippers of *Buddou*. Both the one and the other are distinguished by a yellow habit, and by another circumstance, which must be mentioned in the words of the respective authors. *KNOX* says of the *Buddou* Priests, "They have the honour of carrying the *Tallipot* with the broad end over their heads foremost, which none but the King does." And *M. DE LA LOUBERE* says of the *Siamese* priests, "To defend themselves from the sun they have the *Talapat*, which is their little umbrella, in the form of a screen\*."

\* "Pour se garantir du soleil ils ont le Talapat, qui est leur petit parasol en forme d'écran."

The word here used is common to most of the *Hindoo* languages, and signifies *the leaf of the Palmyra tree*. M. DE LA LOUBERE mentions it as a *Siamese* word, without seeming to know its origin or primary signification.

4thly. The priests of *Buddon*, as well as those of *Sommonacodom*, are bound to celibacy, as long as they continue in the profession; but both the one and the other are allowed to lay it down and marry.

5thly. They both eat flesh, but will not kill the animal.

6thly. The priests of either nation are of no particular tribe, but are chosen out of the body of the people.

These circumstances plainly show that this is a system of religion different from that of the *Veds*; and some of them are totally inconsistent with the principles and practice of the *Bramins*. And, indeed, it is manifest, from KNOX's whole account, that the religion of the *Chingelays* is quite distinct from that which prevails at this day among the *Hindoos*, nor does it appear that there is such a race of men as that of the *Bramins* among them. The only part in which there seems to be any agreement is in the worship of the *Debtahs*, which has probably crept in among them from their *Tamulian* neighbours; but that is carried on in a manner very different from the *Braminical* system, and appears to be held by the nation at large in very great contempt, if not abhorrence. KNOX's account of it is this: " Their temples (i. e. those of the *Debtahs*) are, he says, " called *Covels*," which is the *Tamulic* word for *Pagoda*. He then goes on to say, " A man piously disposed, builds a small house at his own charge,

“ charge, which is the *temple*, and *himself becomes priest thereof*. This  
 “ house is seldom called *God's House*, but most usually *Jacco*, the *Devil's*.”  
 But of the prevailing religion he speaks in very different terms, and describes it as carried on with much parade and splendour, and attended with marks of great antiquity. “ The pagodas, or temples of their gods,  
 “ says he, are so many that I cannot number them. Many of them are  
 “ of rare and exquisite work, built of hewn stone, engraven with images  
 “ and figures; but by whom, and when, I could not attain to know, the inhabitants themselves being ignorant therein. But sure I am, they were  
 “ built by far more ingenious artificers than the Chingelays that now are  
 “ on the land. For the Portuguese, in their invasions, have defaced some of  
 “ them, which there is none found that hath skill enough to repair to this  
 “ day.” In another place, he says, “ Here are some ancient writings, engraved, upon rocks, which puzzle all that see them. There are divers  
 “ great rocks in divers parts in *Cande Uda*, and in the northern parts.  
 “ These rocks are cut deep with great letters for the space of some yards,  
 “ so deep that they may last to the world's end. No body can read them,  
 “ or make any thing of them. I have asked Malabars and Gentoos, as  
 “ well as Chingelays and Moors, but none of them understood them.  
 “ There is an ancient temple, *Goddiladenni* in *Yattanour*, stands by a  
 “ place where there are of these letters.” From all which the antiquity of the nation and their religion is sufficiently evident; and from other passages it is plain, that the worship of *Buddou*, in particular, has been from remote times a very eminent part of that religion; for the same author, speaking of the tree at *Anurodgburro*, in the northern part of the island, which is sacred to *Buddou*, says, “ The due performance of this worship  
 “ they reckon not a little meritorious; inasmuch that as they report,  
 “ ninety Kings have reigned there successively, where, by the ruins that

“ still

“ still remain, it appears they spared not for pains and labour, to build  
 “ temples and high monuments to the honour of this God, as if they had  
 “ been born to hew rocks and great stones, and lay them up in heaps.  
 “ These Kings are now happy spirits, having merited it by these labours.”  
 And again he says, “ For this God, above all other, they seem to have an  
 “ high respect and devotion,” &c.

And from other authorities it will appear, that this worship has formerly been by no means confined to *Ceylone*, but has prevailed in several parts of *India* prior to that of the *Bramins*: nay, that this has been the case even so late as the ninth and twelfth centuries of the *Christian Æra*.

In the well-known\* *Anciennes Relations*, translated from the *Arabic*, by that eminent orientalist EUSEBIUS RENAUDOT, the the *Arabian* traveller gives this account of the custom of dancing-women, which continues to this day in the *Decan*, but is not known among the *Hindoos* of *Bengal*, or *Hindustan* proper.

“ There are in India publick women, called *women of the idol*, and the  
 “ origin of this custom is this: when a woman has made a vow for the pur-  
 “ pose of having children, if she brings into the world a pretty daughter, she  
 “ carries it to *Bod*, (so they call the idol which they adore,) and leaves it  
 “ with him †.”

\* *Anciennes Relations des Indes et de la Chine, de deux Voyageurs Mohametans, qui y allerent dans le neuvieme Siecle. Paris 1718, 8vo.*

† “ Il y a dans les Indes des femmes publiques, appellées, femmes de l'idole, l'origine de cette coutume est telle. Lors qu'une femme a fait un vœu pour avoir des enfans, si elle met au monde une belle fille, elle l'apporte au *Bod*, c'est ainsi qu'ils appellent l'idole qu'ils adorent, aupres duquel elle la laisse, &c. *Anc. Rel.* p. 109.

This

This is a pretty just account of this custom, as it prevails at this day in the *Decan*; for children are, indeed, devoted to this profession by their parents, and when they grow up in it, they are called, in *Tamul*, *D'radasi*, or *female slaves of the idol*. But it is evident they have changed their master since this *Arabian* account was written, for there is no idol of the name of *Bod* now worshipped there. And the circumstance of this custom being unknown in other parts of *India*, would lead one to suspect, that the *Bramins*, on introducing their system of religion into that country, had thought fit to retain this part of the former worship, as being equally agreeable to themselves and their new disciples.

The same *Arabian* travellers give us an account of a very powerful race of *Hindoo* kings, according to them, indeed, the most powerful in *India*, who then reigned on the *Malabar* coast with the title of *Balhâra*. Their dominion appears to have extended over *Guzerat*, and the greatest part, if not the whole, of the ancient kingdom of *Visiapoora*. For the *Arabian* geographer quoted by M. *RENAUDOT*, makes *Nahelvárah* the metropolis of these princes, which is, doubtless, *Naherwah*, the ancient capital of *Guzerat*; though M. *RENAUDOT* seems not to have known that place, and the rest of the description sufficiently shows the great extent of their dominion southward. M. *D'ANVILLE* speaks of this race of kings on the authority of the *Arabian* geographer *EDRISI*, who wrote in the twelfth century, according to whom it appears, that their religion was, even so late as that period, not the *Braminical*, but that of which we are now speaking. M. *D'ANVILLE*'S words are these: " *Edrisi* acquaints us with the religion which this Prince professed in saying, that his worship was addressed to *Bodda*, who, according to St. Jerome and Clemens Alexandrinus,

“ was the founder of the sect of the Gymnosophists, in like manner as the  
 “ Bramins were used to attribute their institution to Brahma\*.”

The authority of CLEMENS ALEXANDRINUS is also cited on the same subject by REIANDUS in his 11th Dissertation, where, treating of the language of *Ceylone*, he explains the word *Vehâr*, above spoken of, in these terms.

“ Vehâr signifies a temple of their principal God Buddou, who, as Clemens  
 “ Alexandrinus has long ago observed, was worshipped as a God by the  
 “ Hindoost.”

After the above quotations, the following extract from the voyage of that inquisitive and ingenious traveller M. GENTIL, published in 1779, is given as a further and very remarkable illustration of this subject.

“ This system is also that of the Bramins of our time ; it forms the basis of  
 “ that religion, which they have brought with them into the southern parts  
 “ of the Peninsula of Hindostan, into Madura, Tanjore, and Maïffore.

“ There was then in those parts of India, and principally on the Coast  
 “ of Choromandel and Ceylone, a sort of worshîp, the precepts of which

\* “ L'Edrisi nous instruit sur la religion que professoit ce Prince, en disant que son culte s'adressoit  
 “ a Bodda, que selon St. JEROME and St. CLEMENT D'ALEXANDRIE, avoit ete l'instituteur des  
 “ Gymnosophistes comme les Brachmanes rapportoient a Brahma leur institut.” Ant. Geog. de  
 L'Inde, p. 94.

† “ *Vehâr*, templum dei primarij Buddoe *plurima* quem Indos ut Deum venerari jam olim notavit  
 “ Clemens Alexandrinus. Strom. lib. 1. p. 223. Rel. Disf. pars tertia, p. 85.

“ we are quite unacquainted with. The God, Baouth, of whom at present  
 “ they know no more in India than the name, was the object of this worship ;  
 “ but it is now totally abolished, except that there may possibly yet be found  
 “ some families of Indians, who have remained faithful to Baouth, and do  
 “ not acknowledge the religion of the Bramins, and who are on that account  
 “ separated from and despised by the other casts.

“ I have not, indeed, heard that there are any such families in the neigh-  
 “ bourhood of Pondichery ; but there is a circumstance well worthy of re-  
 “ mark, which none of the travellers that have treated of the Coast of  
 “ Choromandel and Pondichery seem to have noticed. It is this, that at  
 “ a short league’s distance to the south of this town, in the plain of Vir-  
 “ patnam, and pretty near the river, we find a statue of granite very  
 “ hard and beautiful. This statue, which is from three feet to three and a  
 “ half in height, is sunk in the sand to the waist, and weighs doubt-  
 “ less many thousand weight ; it is, as it were abandoned in the midst of  
 “ this extensive plain. I cannot give a better idea of it, than by saying,  
 “ that it exactly agrees with and resembles the Sommonacodom of the  
 “ Siamese ; its head is of the same form, it has the same features, its arms  
 “ are in the same attitude, and its ears are exactly similar. The form of  
 “ this divinity, which has certainly been made in the country, and which  
 “ in no respect resembles the present idols of the Gentoos, struck me as I  
 “ passed this plain. I made various inquiries concerning this singular figure,  
 “ and the Tamulians, one and all, assured me that this was the God Baouth,  
 “ who was now no longer regarded, for that his worship and his festivals  
 “ had been abolished ever since the Bramins had made themselves masters  
 “ of the people’s faith\*.”

\* “ Ce système est aussi celui des Brames de nos jours ; il fait la base de la religion qu’ils ont  
 “ apportée dans le sud de la presqu’île de l’Indoustan, le Madure, le Tangaour, et le Malissour.



M. GENTIL then goes on to say a good deal more upon this subject, in the course of which he supposes, that this Deity is the *Fo* of the *Chinese*, whose worship, by their own accounts, was brought from *India*. And, indeed, the abridgment of the name *Pout*, mentioned in a note of this paper, which the vulgar *Siamese* reduce to the single syllable *Po*, seems to countenance this opinion. But as this is foreign to our present purpose, and the above passages, it is hoped, are sufficient to establish what was proposed, it seems high time to take leave of this subject, with an apology for that prolixity, which is inseparable from this kind of discussion.

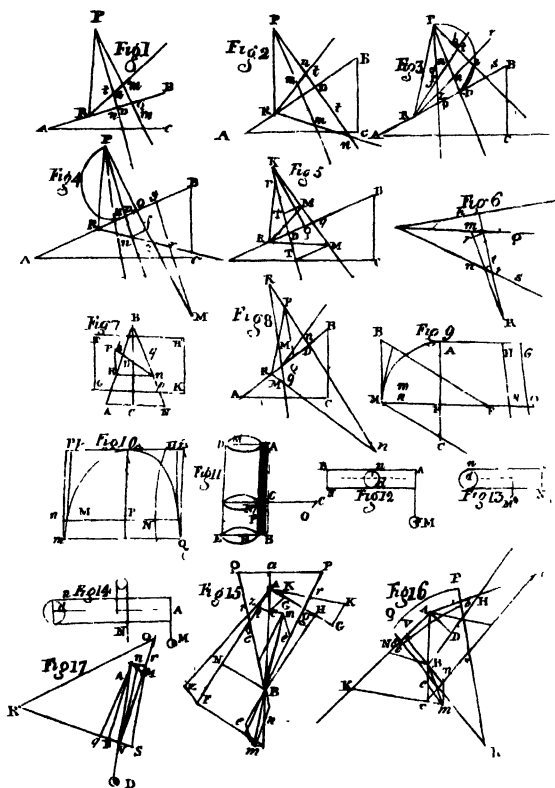
17th June, 1784.

“ Il y avoit alors dans ces parties de l'Inde, & principalement a la Côte de Coromandel & a Ceylan, un Culte dont on ignore absolument les Dogmes: le Dieu Baouth, dont on ne connoit aujourd'hui, dans l'Inde, que le Nom, étoit l'objet de ce Culte; mais il est tout-à-fait aboli, si ce n'est qu'il se trouve encore quelques familles d'Indiens séparés & méprisés des autres Castes, qui sont restés fideles à Baouth, & qui ne reconnoissent point la religion des Brame.

“ Je n'ai pas entendu dire qu'il y ait de ces familles aux environs de Pondichery; cependant, une chose tres digne de remarque, & a laquelle aucun des Voyageurs qui parlent de la Côte de Coromandel & de Pondichery, n'ont fait attention, est que l'on trouve a une petite lieue au sud de cette Ville, dans la plaine de Virapatnam, assez pres de la Riviere, une statue de *Gran* tres-dur & tres-beau. cette statue, d'environ trois pieds a trois pieds & demi de hauteur, est enfoncée dans le sable jusqu'à la Ceinture, & pese sans doute plusieurs Milliers; elle est comme abandonnée au milieu de cette vaste plaine: je ne peux mieux en donner une idée, qu'en disant qu'elle est exactement conforme & ressemblante a *Sommonaoudom* des Siamois; c'est la meme forme de Tête, ce sont les memes traits dans le Visage, c'est la même attitude dans les Bras, & les Oreilles sont absolument semblables. La forme de cette divinite, qui certainement a été faite dans le pays, & qui ne ressemble en rien aux divinités actuelles des Gentils, m'avoit frappé lorsque je passai dans cette plaine. Je fis diverses informations sur cette figure singuliere, les Tamouls m'assurèrent tous que c'étoit Baouth qu'on ne regardoit plus; que son Culte & ses fêtes étoient cessées depuis que les Brame étoient rendus les Maîtres de la Crance du peuple.”



# Vol. I.



## VI.

## HINTS RELATIVE TO FRICTION IN MECHANICS.

By MR. REUBEN BURROW.

## HYPOTHESIS.

**I**N the following estimation of friction, the weight or force necessary to overcome the resistance, &c. is supposed to be proportional to the pressure.

## OF FRICTION IN THE INCLINED PLANE.

Let  $AB$  be an inclined plane\*, and let  $PR$  represent a weight sustained on it by any force  $Rm$ , acting in the direction  $Rm$ , and draw  $PD$  perpendicular to  $AB$ , and let  $Rm$  meet  $PD$  in  $n$ : Now as  $Rn$  represents the force that would be necessary to sustain the body, exclusive of friction, and  $Pn$  represents the pressure against the plane, if  $mt$  be drawn perpendicular to  $PD$  meeting it in  $t$ , then will  $nm$  be the force necessary to overcome the friction in that direction, and  $Pt$  the real pressure against the plane  $AB$ , when the whole force  $Rm$ , necessary to overcome both the weight and the friction, acts in the direction  $Rm$ ; and as the force  $nm$  is equivalent to  $nt$  and  $tm$ ; and  $nt$  has no other effect than to alter the pressure, therefore  $tm$  is the only force which overcomes the resistance of friction; and as this force is as the pressure, therefore  $tm$  is proportional to  $Pt$ , and hence the Locus of all the points  $m$ , is a right line.

\* Fig. 1.

Again, suppose the body, instead of being drawn along, to be sustained at rest only upon the plane; this, it is evident, will require a less force than the other, because the friction prevents the body in part from descending\*. Let  $Rm$  be the force required, and let the same construction be made as before; then because  $Rn$  is the force that would be necessary if there was no friction;  $mn$  is the effect of the friction itself; but  $mn$  is equivalent to the forces  $mt$  and  $tn$ ; and as  $Pn$  would be the pressure, exclusive of friction,  $Pt$  is the pressure inclusive; and as the force lost is as the friction, and  $mt$  is as the force lost, therefore  $mt$  is as  $Pt$ , for the friction is as the pressure; consequently the Locus of all the points  $m$  is a right line passing through  $P$ , and making the same angle as  $DPQ$  in the former case, and only differing by being drawn on the contrary side of  $PD$ .

### S C H O L I U M.

In what follows, the force requisite to sustain any body is considered under three different distinctions; first, when it is just barely sufficient to overcome the weight and resistance arising from friction, and the body is considered as just beginning to move in the direction of the force applied, and the force in this case is called the *moving force*: secondly, when this force is diminished till the body would begin to move or descend in a contrary direction, if the force was diminished farther; this last I call the *suspending force*; and it is plain that whatever force is applied to the body less than the moving, and greater than the suspending force, the body will remain at rest: lastly, it is manifest that there is an intermediate state in which such a degree of force may be applied, that the friction will have no effect either way; and this force is the same as would keep the body in equilibrio if there was no friction, because the effect or tendency of fric-

\* Fig. 2.

tion is to keep the body at rest, or prevent it from moving either way; this being premised, there will be little difficulty in the following.

### P R O B L E M I.

Having given the weight of the body to be sustained; the inclination of the plane and the ratio of the friction to the pressure; to find the force requisite to sustain the weight in a given direction.

In the foregoing figures, draw  $PR$  and  $PD$  at right angles to the horizon and plane respectively,  $PR$  representing the weight; take  $PD$  to  $DQ$  as the pressure to the friction, and let  $DQ$  be taken upwards or downwards as the requisite force is motive or suspensive; join  $PQ$  and draw the line  $Rm$  in the given direction meeting  $PQ$  in  $m$ ; then  $Rm$  is the force required.

**COROLLARY 1.** If the friction be the  $n$  part of the pressure, and  $W$  be the weight,  $s$  and  $c$  the sine and cosine of the plane's elevation, then the moving force parallel to the plane will be  $W (s+c:n)$  and the suspending force  $W (s-c:n)$ .

**COROLLARY 2.** If the direction of the force be parallel to the horizon, and  $t$  be the tangent of the plane's elevation, then  $W (tn+1):(n-t)$  will be the moving force, and  $W (tn-1):(n+t)$  the suspending force, and  $Wt$  the force excluding friction.

**EXAMPLE.** If the weight be a ton, the friction  $\frac{1}{4}$  of the pressure;  $AB=5$ ,  $BC=3$ , and  $AC=4$ , then the moving force will be 3235 pounds;  
the

the suspending force 747 pounds, and the force, excluding friction, 1680 pounds; nearly.

## P R O B L E M II.

Given the weight of the body, the inclination of the plane, and the ratio of the friction to the pressure; to find the direction so that the sustaining force may be a given quantity, or the least possible.

Draw DQ and QP as before, and let PR be to Rm as the weight to the given force; then from the center R with a distance equal to Rm, intersect PQ in m; then Rm is the required direction when the force is given; but to have it the least possible, draw Rm at right angles to PQ, then Rm is the direction required.

COROLLARY 1. An expression for the sustaining force, when the least possible, may be found as follows: In the triangles PDQ, RQm, the angle Q is common, therefore  $PQ:PD::RQ:Rm$ ; but PD is a fourth proportional to AB, AC, and PR, and DQ is to PD as 1 to n, supposing this the given ratio; also RD is a fourth proportional to AB, BC, and PR, consequently RQ is equal to DQ either added to, or subtracted from, DR, as it is the first, or second case; and because  $PQ:PD::\sqrt{(nn+1)}:n::RQ:Rm$ , therefore  $Rm=PR(n.BC \pm AC):AB\sqrt{(nn+1)}$  or  $(ns \pm c)W:(\sqrt{nn+1})$ , by substituting s and c for the natural sine and cosine of the plane's elevation, and using the negative or affirmative sign as the force required, is the moving or suspending one respectively.

EXAMPLE.

EXAMPLE. If  $AB=5$ ,  $BC=3$ , and  $AC=4$ , and the weight 1 ton, then the least moving and sustaining forces will be 1825 and 702 pounds respectively.

COROLLARY 2. Because the triangles  $PDQ$  and  $RQm$  are similar, and the ratio of  $PD$  to  $DQ$  constant to each fixed value of  $n$ , therefore the angle  $QRm$  being equal to  $DPQ$ , will also be constant, whether the inclination of the plane be variable or not; and hence the angles of the direction with the plane for the draught to be made with the greatest advantage, are found for different values of  $n$  as follows:

$n$	$QRm$	$n$	$QRm$	$n$	$QRm$	$n$	$QRm$	$n$	$QRm$	$n$	$QRm$
1	$0^{\circ} 45'$	2	$26.34$	3	$18.26$	4	$14.2$	5	$11.19$	6	$9.25$
$1\frac{1}{2}$	$35.40$	$2\frac{1}{2}$	$23.58$	$3\frac{1}{2}$	$16.54$	$4\frac{1}{2}$	$13.15$	$5\frac{1}{2}$	$10.47$	$7$	$8.8$
$1\frac{3}{4}$	$33.41$	$2\frac{3}{4}$	$21.48$	$3\frac{3}{4}$	$15.57$	$4\frac{3}{4}$	$12.32$	$5\frac{3}{4}$	$10.16$	$8$	$7.8$
$1\frac{1}{4}$	$29.45$	$2\frac{1}{4}$	$19.59$	$3\frac{1}{4}$	$14.56$	$4\frac{1}{4}$	$11.53$	$5\frac{1}{4}$	$9.57$	$9$	$6.20$

N. B. The direction, or angle  $QRm$ , is to be taken below the plane for the suspending, and above the plane for the moving, force.

SCHOLIUM. Though at first sight the former part of the above problem, which shews the best method of applying an active force, seems superior to the other, yet, on farther consideration, the other appears of equal consequence, and particularly in building and fastening walls, banks of earth and fortifications, &c. and the application of what are called *land-ties*, &c. Thus if a weight, for instance, is to be drawn along the plane  $RB$ , and the friction be  $\frac{1}{4}$  of the pressure, the best direction is when  $Rm$  makes an angle of  $18^{\circ} 26'$  above the plane, but if the weight is a quantity of earth

or



or stone, or any thing to be suspended, as in the case of land ties, the best angle (on the foregoing supposition) must be  $18^{\circ} 26'$  below the plane.

### S C H O L I U M.

In those propositions the friction is estimated according to the most generally received opinion, that the resistance is proportional to the whole pressure compounded of the weight of the body, and the additional force necessary to overcome the friction; but it has been asserted, that there may be cases where the friction is not proportional to the whole pressure, but to that which would arise if the body was sustained in a given direction, exclusive of friction; and that there might also be cases, where the resistance arising from tenacity or cohesion might be as the relative pressure against the plane, and the force to overcome it the same in every direction; something similar to a globe stuck fast in wet tenacious clay; I shall therefore give solutions to both cases.

In the first case \*, the force requisite to sustain the body in direction RV, exclusive of friction, is  $Rn$ ; and as  $Rn$  is equivalent to  $RD$  and  $Dn$ , therefore  $Pn$  is the pressure exclusive of friction: and as the friction is the  $n$  part of the pressure, the force acting parallel to  $AB$  to overcome it, is the  $n$  part of  $Pn$ ; but the force which acting in direction  $Rn$  will be equivalent to the  $n$  part of  $Pn$  in the direction  $Rn$ , is a fourth proportional to  $n$  times  $RD$ ,  $Pn$ , and  $Rn$ ; but because  $DQ$  is the  $n$  part of  $DP$ , therefore  $fn$  is the  $n$  part of  $Pn$ , and the fourth proportional aforesaid will be  $nz$ ; consequently the sum or difference of  $Rn$  and  $nz$  must be a given quantity or the least possible: the problem therefore is reduced † to drawing a line  $Rn$  from the given point  $R$ , meeting the two lines  $PD$  and  $PQ$  given in posi-

\* Fig. 3.

† Fig. 4.

tion in  $n$  and  $z$ , so that  $nz$  added to or taken from  $Rn$ , the sum or difference may be a given quantity, or the least possible. To do this, let  $DS$  be taken equal to  $DR$ , and draw  $Sr$  parallel to  $PD$  meeting  $PQ$  in  $M$ ; then because  $Rn$  is equal to  $rn$ , the sum or difference of the quantities aforesaid is  $rz$ ; and when  $rz$  is required to be a given quantity, the question is reduced to that particular case of the inclinations of *APOLLONIUS*, in solids, which has been resolved by *NEWTON* and *BARROW*; the limits of the Problem, or the mode of drawing the line  $Rr$ , so that the intercepted part  $rz$  may be the least possible, may be investigated as follows:

\* Suppose it done, and  $Rrz$  the position required, and let  $Rnm$  be indefinitely near to  $Rz$ , and  $Mh$  perpendicular to  $Rz$ ; then by applying the analysis of the ancients to the *Newtonian* doctrine of prime and ultimate ratios,  $mn$  is equal to  $zr$ ; and if from the centre  $R$ , with the distances  $Rz$  and  $Rn$ , the arcs  $zv$  and  $nt$  be supposed to be described,  $vn$  is equal to  $zt$ , and consequently  $tr$  equal to  $mv$ ; but  $rt:tn::rh:Mh$ , and  $tn:zv::Rr:Rz$ , and  $zv:vm::Mh:hv$ , whence by compounding the proportions,  $ti:vm::Rr.rh.Rz.zh$ , and as the two first terms are equal, the two last are equal, and consequently  $Rr:Rz::zh:rh$ , and dividing  $Rr:rz::zh:rz$ , therefore  $Rr$  is equal to  $zh$ , and consequently the point  $h$  is in an hyperbola, whose asymptotes are  $QM$  and  $SM$  produced: but because the angle  $MhR$  is a right angle, the point  $h$  is also in the circumference of a circle; therefore a line drawn from  $R$  to  $h$ , the point where the hyperbola and circle intersect, is the position required.

In the other case, where the resistance arising from tenacity or cohesion is supposed to be as the relative pressure against the plane, and the force to

\* Fig. 6.

overcome it the same in each direction, we have  $Rn$  for the sustaining force, exclusive of friction; and the  $n$  part of  $Pn$  for the friction; and consequently the sum or difference of these is the expression for the whole force; and the Problem may be thus constructed. Take  $PD$  to  $DQ$  as the pressure to the friction, and join  $PQ$ ; on  $PD$  describe a circle, in which take  $Dv$  equal to  $DQ$ ; join  $PV$ , and draw  $RV$  perpendicular to it: then  $RV$  will represent the direction and measure of the whole force when it is the least possible.

For  $DQ$  and  $Dv$  are equal, and consequently  $nf$  is equal to  $Vn$ ; but  $DQ$  is the  $n$  part of  $DP$ , therefore  $nf$  or  $Vn$  is the  $n$  part of  $Pn$ , and consequently  $RV$  is equal to the sum or difference of  $Rn$ , and the  $n$  part of  $Pn$ ; but  $RV$  is the least possible by construction, and therefore the other is a minimum also. For draw any other line  $Rk$  meeting  $RV$  in  $k$  and  $PD$  in  $m$ ; and draw  $mq$ ,  $mt$ , parallel to  $DQ$  and  $Dv$ ; then the sum or difference of  $Rm$  and  $mt$  is equal to the sum or difference of  $Rm$  and  $mq$ ; but the sum or difference of  $Rm$  and  $mt$  is greater than  $RV$ , and therefore the sum or difference of  $Rn$  and the  $n$  part of  $Pn$  is the least possible.

### P R O B L E M III.

Given the weight of the body, the inclination of the plane, and the force sustaining the body in a given direction; to find the ratio of the friction to the pressure

Take  $PR$  as before, (see Fig. 1. 2.) draw  $Rm$  in the given direction, and take  $PR$  to  $Rm$  as the weight of the body to the force sustaining it; draw  $Pm$  meeting  $AB$  in  $Q$ . and  $PD$  perpendicular to  $AB$ ; then  $PD$  is to  $DQ$  as the pressure to the friction.

PROBLEM

## P R O B L E M IV.

If  $AhqN$  be the segment of an equilateral triangle, which, by moving parallel to itself and the horizon, generates a solid, upon which a figure  $hmGEIIKpqh$  moves, touching the former in  $hm$  and  $qp$ ; required the effect of the friction; still supposing it the  $n$  part of the pressure.

Let  $P$  be the center of gravity of half the body\*, and  $PR$  its weight as before; then the body by means of its inflexibility is kept together in the same manner as if it was actuated by a force parallel to the horizon; but if  $PDn$  be perpendicular to  $Ah$ , and  $Rn$  parallel to the horizontal line  $AC$ , meeting  $PD$  in  $n$ ,  $Pn$  will be the pressure against the side  $Ah$ , and the friction is the  $n$  part of  $Pn$ ; but  $PR : Pn :: AC : AB$ ; therefore if  $AC$  represent the weight of half the body, the  $n$  part of  $AB$  will express the weight requisite to overcome the friction for that half; and by doubling the expressions they serve for the whole. Wherefore let  $W$  represent the weight of the body,  $f$  the secant of the angle  $BAC$ ; then  $Wf$  will be the pressure against the plane  $AD$ ; and the  $n$  part of  $Wf$  the force necessary to overcome the friction; and as this last is the force necessary to draw the body along a horizontal plane, therefore the force necessary to draw the body along a horizontal plane is to that necessary to draw it along the body whose section is  $AhqN$ , as  $AC$  to  $AB$  or as  $1$  to  $f$ .

Because when the angle  $CAB$  is given, the ratio of  $PR$  to  $Pn$  is constant; therefore when the solid whose section is  $AhqN$  is elevated, making an angle with the horizon, so that its base forms an inclined plane;  $PR$  in that case represents the pressure in a normal direction to that plane, and

\* Fig. 7.

On the pressure against the solid; and as the friction is increased in the ratio of the pressure, therefore if the pressure which the body would have on the inclined plane be increased in the ratio of AC to AB, or radius to the secant of the angle CAB, then the pressure on the angular plane or body, whose perpendicular section is AhqN, will be had, and consequently its n part, or the friction. Hence this construction\*; let PR represent the weight; then PD at right angles to AB represents the pressure that the body would exert against the common inclined plane; take DK to DP as AB in the foregoing figure to AC, or as the secant of the inclination of the angular plane with its base to radius; let Dq be the n part of DK, and join Kq; then RM drawn any how to meet Kq in M, gives RM for the measure of the whole force in that direction; and it is the moving or suspending force according as Dq is taken upwards or downwards in the line AB.

It is evident that Kq is parallel to PQ, and therefore though the least force (which is perpendicular to Kq) differ from that in the former cases, yet the directions for having the greatest effect are still the same as in the foregoing table: the demonstration is in effect the same as the first.

COROLLARY. By supposing  $f$  to be the secant of the angle †, that the sides of the angular plane make with the base, proceeding as Corollary 2d of Problem 1st, and putting  $t$  for the natural tangent of the plane's inclination, and  $W$  for PR the weight, we have  $W (tn+f):(n-t)$  for the moving; and  $W (tn-f):(n+t)$  for the suspending force, necessary to draw the body along the angular inclined plane by a force acting parallel to the base of the plane.

\* Fig. 5.

† Fig. 8.

EXAMPLE.

**EXAMPLE.** Let AB, BC, and AC, be 5, 3, and 4 respectively, and let the inclination of the sides be  $45^\circ$ ; the weight of a ton and the friction one third of the pressure; then 3648 pounds is the moving, and 499 the suspending force.

### S C H O L I U M.

In this proposition, those parts of the plane on which the body moves, are supposed rectilinear, as mostly happens in practice; but the friction is easily estimated in curvilinear surfaces, and may be found generally as follows:

Let AMP\* be half the section perpendicular to the horizon, and to the axis of the solid which forms the curvilinear plane on which the body is moved; AP the axis; PM the ordinate, and MS a tangent to the curve at the point M, also let RM represent the weight or pressure in a direction perpendicular to the horizon at the point M; and let RF be perpendicular to MS meeting MP in F; also let PN be taken equal to MR, and PQ equal to RF; and suppose the same construction to be made for every point of the curve, and let HN be the locus of all the points N, and GQ the locus of all the points Q; then will the friction, when drawn along the horizontal plane, be to the friction of the same body when drawn along the curvilinear plane in the same direction, as the area APNH to the area APQG.

For the friction on the horizontal plane being as the sum of the pressures, is as the sum of all the elementary lines MR or PN; that is, as the area AHN; and the friction on the curvilinear plane is for the same

\* Fig. 7.

reason as the sum of all the  $RF$  or  $PQ$ , namely, as the area  $APQG$ ; hence the truth of the proposition is manifest.

**COROLLARY 1.** Because  $Mn$  or the fluxion of  $y$  is to  $Mm$  the fluxion of the curve, as  $MR$  or  $PN$  to  $RF$  or  $PQ$ , therefore if  $PN$  be a function of  $AP$ ,  $PQ$  will be a fourth proportional to the fluxion of the ordinate, the fluxion of the curve  $AM$ , and this function; wherefore if the curves  $HN$  and  $AM$  be given; the nature of the curve  $GQ$  will be known, and its area may be found by the common methods of quadratures.

**COROLLARY 2.** It is evident that when the planes are inclined to the horizon, the frictions of the right and curvilinear planes are still in the same ratio as in the preceding cases, and consequently may be found by the same mode of proceeding.

**COROLLARY 3.** It is also evident, that the above method holds good whether the parts of the body are connected together or not, with respect to their motion in the direction  $RM$ , so long as each elementary part  $MR$  may be considered as sustained at the point  $M$  by a force parallel to  $MP$ ; but when the body is rigid or inflexible, the case becomes more simple, for  $MR$  is then constant, and  $APNH$  becomes a parallelogram.

**COROLLARY 4.** By supposing given properties to exist in any two of the curves  $AM$ ,  $HN$ , or  $GQ$ , the nature of the third will be known; and hence a number of problems relative to friction may be proposed and resolved by a proper application of the direct and inverse methods of fluxions.

**PROPO-**

## PROPOSITION 5. THEOREM.

In the application of forces to overcome friction, the same allowances must be made for the forces acting to advantage or disadvantage, by means of levers or other mechanical powers, as are made in the common doctrine; for instance, if a weight of two pounds, by acting, at the distance of one foot from the fulcrum of a lever, be sufficient to overcome the friction, then one pound at two feet distance will have the same effect, &c.

This is too evident to need a demonstration.

## OF FRICTION IN THE SCREW.

As any force acting perpendicular to the direction of a moving body does not affect the motion of the body in that direction, so the force acting perpendicular to the axis of the screw has no effect on the motion of a body raised thereby exclusive of friction; it therefore requires the same force to raise a body by means of a screw, as to raise the same body in equal time along an inclined plane of the same elevation, as the threads of the screw by means of a force acting parallel to the base of the inclined plane: now, if we suppose the weight so contracted or condensed as to be capable of being placed on one of the threads of the screw, and fastened to an imaginary lever always perpendicular to its axis, then it is evident, this lever will have no effect but to change the direction of the weight, and keep it in the midst of the thread of the screw; and if a force be applied at the weight always perpendicular to this lever, so as to sustain or draw it along this force will be determined exactly the same as was done before in the inclined plane: but the rigidity of the parts of the “female screw”



screw" serves exactly the same purpose as this imaginary lever, and makes the weight act upon the threads like a body sustained on an inclined plane by a force parallel to its base; and as the force to overcome both the weight and the friction is reciprocally as the distance from the center of the axis, therefore the distance of the power from the center of the axis, is to the distance from the same center to the middle of the threads of the screw, as the force necessary to sustain the body on the inclined plane, to the same force in the screw at the distance of the power. The same proportion holds good whether the threads be cut perpendicular to the axis or in an angle; for in the first, the common plane is to be taken; and in the second, the inclined or angular one considered in the fourth proposition: Wherefore if  $d$  be the distance from the center of the axis to the middle of the threads of the screw;  $D$  the distance of the same center to the point where the force is applied, the force to overcome the weight and friction is  $Wd (tn \pm f) (n \mp t) D$ , where the letters express the same things as before, and the upper sign is for the moving, and the lower for the suspending force. N.B.  $t$  is the natural tangent of the angle made by a line touching one of the threads, and a plane at right angles to the axis of the screw; or it is equal to the distance of the respective edges of two threads, divided by the circumference of the cylinder, out of which the screw is cut.

**COROLLARY 1.** When lines drawn from the center of the axis of the screw to coincide with the threads, are at right angles to the axis, the above expression becomes  $Wd (tn \pm 1) : (n \mp t) D$ , for  $f$  becomes radius or unity.

**COROLLARY 2.** When  $n$  is equal to  $t$ , the moving force will be infinite;

nite; also the suspending force will be nothing when  $t$  is the  $n$  part of  $f$ ; and when  $Wd(tn-f) : (n+t) D$ , becomes negative, it expresses the quantity of force, which must act in a contrary direction to reduce the body just to a state of suspension.

### SCHOLIUM.

It would be needless to make any allowance for the curvilinear surfaces of the threads of screws, as they seldom differ much from the two foregoing forms; neither is it of much consequence to allow for their parts being at different distances from the axis, as their breadth seldom bears any considerable ratio to the length of the levers by which they act; but the case is different when large bodies revolve on each other, and therefore it will be necessary to shew the mode of proceeding in such cases.

Let  $MmAQ$  be a convex solid, generated by the revolution of the curve  $MAQ$ , about its axis perpendicular to the horizon; and  $MRSQ$  a concave body exactly fitting it; then if this last body be revolved about the axis  $AP$  by means of the lever  $Pf$ , the force necessary to overcome the friction of one body turning upon the other may be found as follows: suppose the revolving body divided into an infinite number of concentric tubes, that may descend independent of each other, and press freely against the body on which they revolve, and yet be so connected that the lever  $Pf$ , may give the same angular velocity at the same time to each; also let the ordinates  $PN$  of the curve  $HN$  represent the weight or pressure (in a direction perpendicular to the horizon) of each of the indefinitely small parts  $Mk$ , or elementary lines of the body at the distance  $PM$  from the

\* Fig. 10.

axis, and let  $c$  be the circumference of a circle whose radius is unity: then because the friction of each of the elementary tubes  $MRSQ$  is as its pressure, and the pressure is as the number of lines  $Mk$ , and the pressure of each; therefore as this number is as  $PM.Mn.c$ , we have the  $n$  part of this expression for the force which, acting at  $M$ , would overcome the friction of the cylindrical tube, if moved round upon a horizontal plane; but as the pressure of each elementary part is increased in the ratio of  $Mn$  to  $Mm$ , when moved on the solid  $MAQ$ , the real force will be  $(PM.c.Mm.PN) : n$ ; also  $Pf : PM :: (PM.c.Mm.PN) : n$  to the small elementary force which will overcome the last force when acting at  $f$ ; consequently the whole force will be equal to the fluent of  $PM^2.PN.Mm.c) : (n.Pf)$ .

**COROLLARY.** By means of the curves  $AM$ ,  $HN$ , &c. conclusions may be drawn similar to those in the Corollaries to the Scholium of the fourth proposition.

### OF FRICTION IN THE LEVER.

It has been already observed, that a force acting perpendicular to the direction of a body, in motion, does not alter the body's motion in that direction; therefore if \* we suppose  $DB$  to be an upright cylinder, and  $AB$  a body touching it in a line as in the figure, and retained close to it by an imaginary force, drawing it perpendicular towards the axis; then if a force  $CP$  be applied to  $C$ , the center of gravity of  $AB$ , and be always supposed to act perpendicularly to the radius  $CN$ , drawn from the center of the axis to the point  $C$ , the friction will be the same in drawing the body round the cylinder, as in drawing it along a horizontal plane with an equal pressure; and if it be moved round by a force acting at a greater distance, the

\* Fig. 11.

force will be reciprocally as the distance: 'on the contrary, if the body AB be fixed, and the cylinder turned round about its axis, the friction will be the same as if the cylinder was fixed, and the body drawn round it by CP, as before: Likewise the friction is the same, whether the cylinder be fixed, and the body AB moved round the axis MR by a force Qc applied at c, or whether the point c be fixed with AB fastened to Cc, and the cylinder be revolved in a circle, whose center is c, so as always to retain its parallelism with respect to any fixt object; and as this last case obtains in the axletrees of carriages, since every point of the wheel's contact with the ground may be considered as the center of motion for that instant, therefore the effect of the resistance arising from the friction of the concave part of the nave upon the axletree, is to the effect that would arise from drawing the same weight over a horizontal plane of the same kind as the parts that rub each other, as the radius of the axis to the radius of the wheel. It must be observed, that this is not the only friction to which carriages are subject, for there is another part, arising from the cohesion of the wheel and the ground at their contact, which is to be found and allowed for by the three first Propositions.

In the above, the pressure and friction have been supposed to be as the weight, as it is on a horizontal plane; but by the Scholium to the fourth Proposition, it is plain that the pressure is greater than the weight, and may be so in any proportion; however, as it appears by calculation, that the pressure on an arc of ninety degrees is to that on its chord, only as 1,183 to 1, when both the concave and convex parts have exactly the same curvature, the difference will be so trifling, when the cylinders have different curvatures as usual, as to require very seldom to be allowed for.

This being premised, let  $M$  \* be a weight placed at the point  $A$  of a lever, moveable about an axis whose center is  $d$  and radius  $dn$ ; and let  $N$  be the sustaining force acting at  $B$ : now it is evident that the pressure on the axis  $d$  differs so little from the weight, that it may be safely taken for it without any considerable error, except in some remarkable cases, which may be allowed for from what has been said already; and therefore the friction which ought in strictness to be taken as the  $n$  part of the pressure, will here be taken as the  $n$  part of the weight upon the axis. Now if  $N$  be taken for the force which, acting at  $B$ , would be just sufficient to keep the weight  $M$  at  $A$  in equilibrio, exclusive of friction, and if  $W$  be the additional force to be added to  $N$  so as to overcome the friction, then will  $M + P$ ,  $M - P$ , and  $P - M$ , be the weight upon the axis at  $d$  in the first, second, and third figures respectively, (supposing the sum of  $M$  and  $N$  to be equal to  $P$ ;) now as the friction is the  $n$  part of each of these quantities, and its effect is to keep the lever in a state of rest, therefore in whatever direction the force at  $N$  endeavours to draw the lever by acting at  $B$ , the friction tends to counteract that force by keeping the lever steady, or acting in a contrary direction at  $n$ ; and as the effect of the friction, and the additional force  $W$ , are in equilibrio, and the friction acts by means of the lever  $dn$ , and the force  $W$  by the lever  $dB$ ; therefore  $Bd$  is to  $dn$  as the sum or difference of the  $n$  part of  $N + W$  and  $M$  is to  $W$ ; consequently  $W = dn (M + N) : (n.Bd - dn)$ , in the first figure;  $W = dn (M - N) : (n.Bd + dn)$ , in the second figure; and in the third figure,  $W = dn (N - M) : (n.Bd - dn)$ : all these are the expressions for the moving forces. \*

To find the suspending forces, or the forces which acting at  $N$ , shall be just sufficient to prevent the weight  $M$  from descending: let  $M$  and  $N$  be

\* Fig. 12, 13, 14.

the same as before, and let  $w$  be the force which, taken from  $N$ , will leave a force just sufficient to prevent  $M$  from descending; then the weight upon  $d$  in the first figure will be  $M+N-w$ ; in the second figure, the weight will be  $M-N+w$ ; and in the third figure,  $N-M-w$ ; and by proceeding as before, the values of  $w$  in the suspending forces are  $dn(M+N):(n.Bd+dn)$ ;  $dn(M-N):(n.Bd-dn)$ , and  $dn(N-M):(n.Bd+dn)$ , in the first, second, and third figures, respectively.

Because  $Bd:dA::M:N$ , therefore if this value of  $N$  be substituted in each of the above expressions for the friction, the whole force capable of sustaining the friction and weight  $M$  will be had: thus for example, the moving force to overcome the friction and weight  $M$  in the first figure, will be  $M(n.dA+dn):(n.Bd-dn)$ , and the suspending force  $M(n.dA-dn):(n.Bd+dn)$ ; in the second figure, the moving force will be  $M(n.dA+dn):(n.Bd+dn)$ , and the suspending force  $M(n.dA-dn):(n.Bd-dn)$ ; and in the third figure, the moving force will be  $M(n.dA-dn):(n.Bd-dn)$ , and the suspending force will be  $M(n.dA+dn):(n.Bd+dn)$ .

The method of finding  $n$  from each of the above equations is evident, and consequently the ratio of the friction to the pressure by experiments.

### OF FRICTION IN THE WEDGE.

Let  $AC^*$  be the force necessary to sustain the wedge  $QPB$  in the direction  $aB$  perpendicular to  $QP$ , friction included; and let  $AB$  be the force exclusive of friction: draw  $AN$  and  $AH$  perpendicular to the  $BQ$  and  $BP$ ;  $CG$  parallel to  $AN$ , and  $CF$  parallel to  $AH$ : Now  $GA$  and  $AF$ , the forces of the wood against the sides of the wedge, in those directions, com-

\* Fig. 15.

pound a force equivalent to the diagonal CA in the direction CA, and therefore a force represented by AC in that direction, must be applied to the head of the wedge at *a* to overcome these forces: Let *gr* be the *n* part of AG, and let the lines Ar be drawn, and also GK and FZ perpendicular to AG and AF meeting the lines Ar in K and Z; then will GK and FZ represent the friction against the sides BP and BQ, being each the *n* part of AG and AF, the pressure against each side, respectively; wherefore if Be be taken in PB, and Bn in BQ equal to GK and FZ respectively, the forces Be and Bn in those directions must compound a force to which the force BC in the direction BC must be equivalent; and consequently if Bm be the force compounded of Be and Bn, and Cm be joined, Cm must be perpendicular to mB; since Be or GK is the force of friction arising from the pressure against BP, which tends to prevent the wedge from moving either in the direction BP or PB; and Bn or FZ has a similar effect with respect to the direction in the line BQ; and by hypothesis BC is just sufficient to balance these forces. It is also evident from what was said concerning the inclined plane, that Be and Bn must be taken in the directions PB and QB for the moving force, but in the directions BP and BQ for the suspending force.

The method of calculation is evident; for as aB, AG, and AF, are perpendicular to QP, BP, and BQ, the triangles QPB and CAG are similar, and the parallelogram Bnme similar to FAGC; whence by supposing certain parts given, the rest may be found, &c.

**COROLLARY.** When the wedge is isosceles the point *m* falls on C, and Be is equal to Bn, and therefore Be or GK is equal to  $(AB+BC)PB:(n.QP)$ ; but  $PB:Ba::aB:BC$ , and therefore  $BC=aBa (AB+BC):(n.QP)$

or

or equal to  $(2Ba.BA) : (n.QP - 2Ba.)$  and therefore  $AC = (n.QP.AB) : (n.QP - 2Ba.)$  and by following the same method for the suspending force, we find  $BC = (2Ba.AB) : (n.QP + 2Ba.)$  and consequently  $AC$  is equal to  $(n.QP.AB) : (n.QP + 2Ba.)$

## S C H O L I U M.

By proceeding in a similar method, the forces of the arch-stones of bridges, &c. may be determined; for let  $QbbP$  be a stone sustained by the parts of the arch pressing against  $Pb$  and  $Qb$ , and let  $A$  be its center of gravity, and  $AB$  perpendicular to the horizon; also let  $AB$  and  $AC$  be the same as before; then because the body is in equilibrio, the force in direction  $AC$  will be equivalent to the force in a contrary direction, arising from the pressures against the body in the directions  $GA$  and  $KA$ , together with the force of friction; and because the pressures are  $AG$  and  $AK$ , if  $Be$  (the  $n$  part of  $AG$ ) be drawn parallel to  $PB$ , and  $Bn$  (the  $n$  part of  $AK$ ) be drawn parallel to  $Qb$ ; and the parallelogram  $Bnme$  be completed, and  $Cm$  joined;  $Bm$  will be the force arising from friction, and the angle  $BmC$  a right angle. The adjacent figure\* is for the moving force; but the method is similar for the suspensive force; and it is evident that the one construction is of use to determine the force which tends to break an arch by pressing it downwards, and the other the force that tends to break it upwards.

But as that excellent mathematician P. FRISI, in his *Istituzioni di Meccanica*, has objected to the division of the force  $AB$  in the forces  $AN$  and  $AH$ , and thence concluded *BELIDOR* and *COUPLET* to have been mistaken on that account in their writings upon bridges; I shall, therefore,

\* Fig. 16.



prove that the common method is really a consequence of what that gentleman himself allows, and that his objections are not well founded. In the first place he allows the force  $AB$  to be equivalent to the forces  $AV$  and  $AD$  or  $VB$ ; now (excluding friction) if that part of the arch which touches  $Pb$  was removed, it is evident  $QbbP$  would immediately begin to descend along  $Qb$  with a force represented by  $VB$  or  $AD$ ; but this descent is prevented by that part of the arch which touches  $Pb$ , and therefore the force of that arch, in the direction  $HA$ , must be such as to be equivalent to  $DA$  in the direction  $DA$  or  $BV$ ; but no force greater or less than  $HA$  will be equivalent to  $DA$  in the direction  $DA$ , and therefore  $HA$  is the real pressure or force against  $Pb$ . Again,  $HD$  is the pressure in a perpendicular direction to  $Qb$  arising from this force; and as  $AV$  is the pressure against  $Qb$  arising from the force  $AB$ , therefore  $AV$ , together with  $HD$ , is the whole pressure against  $Qb$  in the direction  $AV$ ; but because the body is in equilibrio, and consequently the action or force in the direction  $AV$  equal to the reaction in a contrary direction; therefore  $AV + HD$  or  $AN$  (because  $NV$  is equal to  $HD$  by the property of the parallelogram) represents the pressure against  $Qb$ , and  $AH$  the pressure against  $Pb$ ; which is contrary to what P. FIRST asserts, and agreeable to the usual method.

The same learned Author has made another very material mistake, from a similar cause, at page 67 of the aforesaid Treatise, relative to the tension of ropes; which cannot be attributed to haste or inadvertency, as he expressly asserts the holders of the common opinion to be mistaken, in consequence of their using the theory of composition of forces without sufficient precaution: I shall, therefore, after giving his own words, take the liberty of shewing where I apprehend he is mistaken.

“ Parleremo

“ Parleremo più a lungo delle altre ricerche matematiche, alle quali ha dato occasione la controversia insorta intorno alla cupola di S. Pietro. Coll' occasione che si è discorso in Milano di munire la fabbrica del Duomo di un Conduttore elettrico, che dalla cima dell' aguglia si dirimasse, e scendesse per differenti parti del tempio, si è ancora parlato dell' azione, che i fili del Conduttore potrebbero esercitare contra l'aguglia, e si sono proposti varj Problemi intorno alle tensioni delle funi. Io qui aggiungerò le soluzioni, che ho ritrovato, e incomincerò dalla prima risoluzione delle forze tendenti, la quale siccome è interamente differente da quella, che hanno seguitato altri Autori, così non farà meraviglia che porti dei risultati interamente differenti da quelli che sono stati finora pubblicati. Penda il \* filo QVR, dai punti Q, ed R, e vi si attacchi in V il peso P. si produca la verticale PV in A; si esprima il peso P colla retta AV, e dal punto A; si tirino sopra QV, RV le perpendicolari AM, AN. Sarà MV l'intera forza esercitata secondo QV, ed NV farà quella che si eserciterà secondo RV.

“ La stessa cosa si dedurrebbe risolvendo la forza AV nelle due Aq, Ar parallele ai fili QV, RV, e poi risolvendo di nuovo la forza Aq nelle due AN, Nq, e similmente la Ar in due altre AM, Mr. Mentre queste risoluzioni è manifesto che la forza totale esercitata nel tendere il filo QV dev'essere  $Aq - Mr = rV - Mr = MV$ , e la tensione del filo  $RV = Vq - Nq = NV$ .

“ S'ingannerebbe chi misurasse separatamente la tensione del filo QV dalla forza Aq, ossia rV, e la tensione di RV da Ar, oppure da qV. Egli è vero, che le due tensioni equivalgono insieme, come alla sola forza AV, così ancora alle due Ar, Aq, oppure alle quattro insieme AN, Nq, AM, Mr.

\* Fig. 17.

ma nel prendere le tensioni separate bisogna in oltre avvertire, che quando l'angolo QVR non è retto, una porzione di Aq agisce secondo RV, ed una porzione di Ar secondo QV : e separando le azioni fara MV, la tensione del filo QV, ed NV quella di RV."

In the first place, I shall demonstrate the truth of the established method from principles that FRISI has himself allowed ; and, secondly, point out the absurdity of his conclusions.

1. Let Vn and Sr be parallel to AN ; then because NVn is a right angle, and the force VA may be resolved into VN and Vn, in those directions, therefore if RV and VP were to remain in the same position, and the force which now keeps the body suspended by acting in the direction VQ, was to act in the direction Vn with a force expressed by Vn ; it is then granted that the equilibrium would still be maintained, and the tensions would be as Vn and VN ; and therefore, as no force VS whatever, acting at V in the direction RV, can have any effect in the direction Vn perpendicular to RV, it necessarily follows, that the force in any other direction VQ must be such as to be equivalent to Vn in the direction Vn ; but it is likewise granted, that no other force but Vr in the direction VQ can be equivalent to Vn in the direction Vn ; and as the force Vr is equivalent to Vn and VS ; and as VS, or its equal qN, only gives an additional tension to NV, the tension which the cord RV was supposed to have before, which whole tension is equal to the reaction of the tack R ; therefore qV is the tension of the cord RV, and Vr that of Qv.

2. Let the points Q and R coincide, and RV, QV, and VP, will then be perpendicular to the horizon ; and if VQ or VR be assumed to express the

the

the weight  $P$ , then will the points  $A, R, Q, M$ , and  $N$  coincide; and according to FRISI's principle, the tensions of  $RV$ ,  $VQ$ , and  $VP$ , will be equal; but, from the well known principle of the pulley, each cord  $VQ$  and  $VR$  bears but half the weight  $P$ , and therefore this absurdity follows, that a cord is as much stretched with half the weight as it would with the whole.

Again, if the points  $R, V$ , and  $Q$ , be supposed horizontal, it follows, from the common theory, that the tension of the rope  $RVQ$  would be infinite; but  $VN$  and  $VM$  vanish when  $RVQ$  is horizontal, and therefore, by FRISI's principle, the tension in that case would be nothing at all; but it is well known from the most common experiments to be very considerable, even when  $RQV$  is but nearly horizontal; and therefore the new theory of this great mathematician is indefensible.

REMARK. All the foregoing, except the last Scholium, was written in 1775, before the author had seen any thing to speak of on the subject; he had designed and executed great part of an extensive treatise on friction according to different hypotheses; but as no body would be at the risk of publishing it, and he could not afford it himself, the most of it was accidentally lost. What is here given is an extract only of some of the first part, where velocity was not taken into the account, and where there were no complicated algebraic or fluxional expressions, which would be difficult to print in this country.

TO THE HONOURABLE

SIR WILLIAM JONES,

*PRESIDENT OF THE ASIATICK SOCIETY.*

SIR,

I HAVE the honour to obey the orders of the Honourable the Governor General and Council, in transmitting to you, for the information of the *Asiatick Society*, an Extract of a Letter address'd to the Governor General, on the 2d of last month, by Lieutenant SAMUEL TURNER, who was appointed on an embassy to *Tibet*, and a Copy of an Account inclosed in it, of Mr. TURNER's interview with TEESHOO LAMA, at the Monastery of *Terpaling*.

I have the Honour to be, with great respect,

SIR,

Your most obedient and most humble Servant,

E. HAY, *Secretary.*

COUNCIL CHAMBER,  
*Political Department, April 13, 1784.*

*EXTRACT*

## EXTRACT OF A LETTER FROM MR. SAMUEL TURNER

TO THE HONOURABLE THE GOVERNOR GENERAL,

DATED PATNA, 2d MARCH, 1784.

**D**URING my residence in *Tibet*, it was an object I had much at heart, to obtain an interview of the infant *TEKSHOO LAMA*; but the Emperor of *China's* general orders, restricting his guardians to keep him in the strictest privacy, and prohibiting indiscriminately the admission of all persons to his presence, even his votaries, who should come from a distance, appeared to me an obstacle almost insurmountable; yet, however, the Rajah, mindful of the amity subsisting between the Governor and him, and unwilling, I believe, by any act to hazard its interruption, at length consented to grant me that indulgence. As the meeting was attended with very singular and striking circumstances, I could not help noting them with most particular attention; and though the repetition of such facts, interwoven and blended as they are with superstition, may expose me to the imputation of extravagance and exaggeration, yet I should think myself reprehensible to suppress them; and while I divest myself of all prejudice, and assume the part of a faithful narrator, I hope, however tedious the detail I propose to enter into may be found, it will be received with candour, and merit the attention of those for whose perusal and information it is intended, were it only to mark a strong feature in the national character of implicit homage to the great religious sovereign, and to instance the very uncommon, I may say almost unheard of, effects of early tuition.

I shall, perhaps, be still more justified in making this relation, by adverting to that very extraordinary assurance the Rajah of *Teeshow Loomlao*  
made

made me but a few days before my departure from his court, which, without further introduction, I will beg leave literally to recite.

At an interview he allowed me, after having given me my audience of leave, he said, "I had yesterday a vision of our tutelary deity, and to me  
" it was a day replete with much interesting and important matter. This  
" guardian power, who inspires us with his illuminations on every mo-  
" mentous and great occasion, indulged me with a divination, from which  
" I have collected that every thing will be well; set your heart at rest,  
" for though a separation is about to take place between us, yet our friend-  
" ship will not cease to exist: but, through the favour of interposing Pro-  
" vidence, you may rest assured it will encrease, and terminate eventually  
" in that which will be for the best."

I should have paid less regard to so strange an observation, but for this reason, that, however dissonant from other doctrines their positions may be found, yet I judge they are the best foundation to build our reliances upon, and superstition combining with inclination to implant such friendly sentiments in their minds, will ever constitute, the opinion having once obtained, the strongest barrier to their preservation. Opposed to the prejudices of a people, no plan can reasonably be expected to take place: agreeing with them, success must be the result.

*E. HAY, Secretary to the Governor General and Council.*

*A true Extract.*

**COPY**

## VII.

*COPY of an Account given by Mr. TURNER,*

OF HIS

## INTERVIEW WITH TEESHOO LAMA

*At the Monastery of Terpaling, enclosed in Mr. TURNER's Letter to the Honourable the Governor General, dated Patna, 2d March, 1784.*

ON the 3d of December, 1783, I arrived at *Terpaling*, situated on the summit of a high hill; and it was about noon when I entered the gates of the Monastery, which was not long since erected for the reception and education of TEESHOO LAMA. He resides in a palace in the center of the Monastery, which occupies about a mile of ground in circumference, and the whole is encompassed by a wall. The several buildings serve for the accommodation of three hundred *Gylongs*, appointed to perform religious service with TEESHOO LAMA, until he shall be removed to the Monastery and Musnud of *Teeshoo Loomboo*. It is unusual to make visits either here or in *Bootan* on the day of arrival: we therefore rested this day, only receiving and sending messages of compliment.

On the 4th, in the morning, I was allowed to visit TEESHOO LAMA, and found him placed in great form upon his Musnud; on the left side stood his father and mother, on the other the officer particularly appointed to wait upon his person. The Musnud is a fabric of silk cushions piled one upon the other, until the seat is elevated to the height of four feet from the floor; an embroidered silk covered the top, and the sides were decorated with pieces of silk of various colours, suspended from



from the upper edge, and hanging down. By the particular request of TEESHOO LAMA's father, Mr. SAUNDERS and myself wore the *English* drefs.

I advanced, and, as is the custom, presented a white pelong handkerchief; and delivered also into the LAMA's hands the Governor's present of a string of pearls and coral, while the other things were set down before him. Having performed the ceremony of the exchange of handkerchiefs with his father and mother, we took our seats on the right of TEESHOO LAMA.

A multitude of persons, all those ordered to escort me, were admitted to his presence, and allowed to make their prostrations. The infant LAMA turned towards them, and received them all with a chearful and significant look of complacency. His father then addressed me in the *Tibet* language, which was explained to me by the interpreter, that TEESHOO LAMA had been used to remain at rest until this time of the day; but he had awoke very early this morning, and could not be prevailed upon to remain longer in bed; for, added he, "the *English* Gentlemen were arrived, and he could not sleep." During the time we were in the room, I observed the LAMA's eyes were scarce ever turned from us, and when our cups were empty of tea, he appeared uneasy, and throwing back his head, and contracting the skin of his brow, he kept making a noise, for he could not speak, until they were filled again. He took out of a golden cup, containing confects, some burnt sugar, and stretching out his arm, made a motion to his attendants to give them to me. He then sent some in like manner to Mr. SAUNDERS, who was with me. I found myself, though visiting an infant, under the necessity of saying something; for it was hinted to me,

me, that, notwithstanding he is unable to reply, it is not to be inferred that he cannot understand. However, his incapacity of answering excused me many words; and I just briefly said, That the Governor General, on receiving the news of his decease in *China*, was overwhelmed with grief and sorrow, and continued to lament his absence from the world, until the cloud that had overcast the happiness of this nation, by his re-appearance, was dispelled; and then, if possible, a greater degree of joy had taken place than he had experienced of grief on receiving the first mournful news. The Governor wished he might long continue to illumine the world with his presence; and was hopeful that the friendship which had formerly subsisted between them would not be diminished, but rather that it might become still greater than before; and that, by his continuing to shew kindness to my countrymen, there might be an extensive communication between his votaries and the dependants of the *British* nation. The little creature turned, looking steadfastly towards me with the appearance of much attention while I spoke, and nodded with repeated, but slow movements of the head, as though he understood and approved every word, but could not utter a reply. The parents, who stood by all the time, eyed their son with a look of affection, and a smile expressive of heartfelt joy at the propriety of the young LAMA's conduct. His whole regard was turned to us; he was silent and sedate, never once looking towards his parents, as if under their influence at the time; and with whatever pains his manners may have been formed so correct, yet I must own his behaviour on this occasion appeared perfectly natural and spontaneous, and not directed by any action or sign of authority.

The scene in which I was here brought to take a part was too new and extraordinary, however trivial, if not absurd, as it may appear to

some, not to claim from me great attention, and consequently minute remark.

TEESHOO LAMA is at this time about 18 months of age. He did not speak a word, but made most expressive signs, and conducted himself with astonishing dignity and decorum. His complexion is of that hue which in *England* we should term rather brown, but not without colour. His features good, small black eyes, an animated expression of countenance; and altogether I thought him one of the handsomest children I had ever seen. I had but little conversation with the father. He told me he had directions to entertain me three days on account of TEESHOO LAMA; and entreated me with so much earnestness to pass another on his own account, that I could not resist complying with his request. He then invited us for tomorrow to an entertainment he proposed to make at a small distance from the Monastery, which invitation having accepted, we took our leave and retired.

In the course of the afternoon I was visited by two officers of the LAMA's household, both of whom are immediately attendant on his person. They sat and conversed with me some time, enquired after Mr. BOGLE, whom both of them had seen; and then remarking how extremely fortunate it was the young LAMA's having regarded us with very particular notice, observed on the very strong partiality of the former TEESHOO LAMA for the *English*, and that the present one often tried to utter the name of the *English*. I encouraged the thought, hopeful that they would teach the prejudice to strengthen with his increasing age; and they assured me that should he, when he begins to speak, have forgot, they would early teach him to repeat the name of HASTINGS.

On

On the morning of the 6th, I again waited on TEFSHOO LAMA, to present some curiosities I had brought for him from *Bengal*. He was very much struck with a small clock, and had it held to him, watching for a long time the revolutions of the moment hand; he admired it, but with gravity, and without any childish emotion. There was nothing in the ceremony different from the first day's visit. The father and mother were present. I staid about half an hour, and retired, to return and take leave in the afternoon.

The votaries of TEFSHOO LAMA already begin to flock in numbers to pay their adorations to him. Few are yet admitted to his presence. Those who come, esteem it a happiness if he is but shewn to them from the window, and they are able to make their prostrations before he is removed. There came to day a party of *Kilmaaks* (*Calme Tartars*) for purposes of devotion, and to make their offerings to the LAMA. When I returned from visiting him, I saw them standing at the entrance of the square in front of the palace, each with his cap off, his hands being placed together elevated, and held even with his face. They remained upwards of half an hour in this attitude, their eyes fixed upon the apartment of the LAMA, and anxiety very visibly depicted in their countenances. At length, I imagine, he appeared to them; for they began altogether by lifting their hands, still closed, above their heads, then bringing them even with their faces, and after lowering them to their breasts, then separating them: to assist them in sinking and rising, they dropt upon their knees, and struck their heads against the ground. This with the same motions was repeated nine times. They afterwards advanced to deliver their presents, consisting of talents of gold and silver, with the products of their country, to the proper

officer, who having received them, they retired apparently with much satisfaction.

Upon enquiry, I learnt that offerings made in this manner are by no means unfrequent, and in reality constitute one of the most copious sources from which the LAMAS of *Tibet* derive their wealth.

No one thinks himself degraded by performing these humiliations. The persons I allude to, who came for this devout purpose, were attendant on a man of superior rank, that seemed to be more engrossed than the rest in the performance of the ceremony. He wore a rich satin garment, lined with fox skins; and a cap with a tassel of scarlet silk flowing from the center of the crown upon the sides all round, and edged with a broad band of *Siberian* fur.

According to appointment, I went in the afternoon to make my last visit to TEESHOO LAMA. I received his dispatches for the Governor General, and from his parents two pieces of satin for the Governor, with many compliments.

They presented me with a vest, lined with lambskins, making many assurances of a long remembrance, and observing that at this time TEESHOO LAMA is an infant, and incapable of conversing, but they hoped to see me again when he shall have become of age. I replied, that, by favour of the LAMA, I might again visit this country: I looked forward with anxiety to the time when he should mount the Mufnud, and should then be extremely happy in the opportunity of paying my respects. After some expressions and protestations of mutual regard, my visit was concluded: I received

received the handkerchiefs, and took my leave: and am to pursue my journey towards *Bengal* to-morrow at the dawn of day.

(Signed) SAMUEL TURNER.

*A true Copy,*

E. HAY, *Secretary to the Governor General and Council.*

TO SIR WILLIAM JONES, KNIGHT,

*PRESIDENT OF THE ASIATICK SOCIETY.*

SIR,

THE Honourable the Governor General having received and laid before the Board a Letter address'd to him by Lieutenant SAMUEL TURNER, containing the Account of a Journey made to *Teshoo Loomtoo* by a *Gosseyn*, named POORUNGFER, and the circumstances of his reception by TEESHOO LAMA; and the Board deeming it worthy of the Attention of the *Asiatick Society*, I have the Honour, in Obedience to their Directions, to transmit to you a Copy of it.

I have the Honour to be,

SIR,

Your most obedient humble Servant,

E. HAY, *Secretary.*

FORT WILLIAM,  
*Secret Department, Feb. 22, 1786.*

VIII.

AN ACCOUNT OF A JOURNEY TO TIBET.

TO THE HONOURABLE

JOHN MACPHERSON, *Esq.*

GOVERNOR GENERAL, &c. &c. &c.

FORT WILLIAM.

HONOURABLE SIR,

HAVING, in obedience to the instructions with which you were pleased to honour me, examined POORUNGEER, the *Goswain*, who has at different times been employed in deputations to the late TEESHOO LAMA, formerly accompanied him to the court of *Pekin* and who is lately again returned from *Tibet*, and having collected from him such an account of the journey he has just performed, and other information, as he could give me relative to the countries he has left, I beg leave to submit it to you in the following narrative.

In the beginning of last year POORUNGEER, having received dispatches from Mr. HASTINGS, a short time previous to his departure from *Bengal*, for TEESHOO LAMA and the Regent of *Teeshoo Loomboo*, immediately set about preparing for the distant journey he had engaged to undertake, which employed him until the beginning of the following month of March, when



when I beg leave to recal to your remembrance I had the honour to present him to you for his dismissal. He then commenced his journey from *Calcutta*, and early in the month of April had passed, as he relates, the limits of the Company's Provinces, and entered the mountains that constitute the kingdom of *Bootan*, where, in the prosecution of his journey, he received from the subjects of the DAIB RAJA the most ample and voluntary assistance to the frontier of his territory; nor met with any impediment to oppose his progress until he came upon the borders of *Tibet*. Here he was compelled to halt for near a fortnight by heavy a fall of snow, that commenced upon his arrival, and continued incessantly for the space of six days, covering the face of the country to so great a depth, as totally to put a stop to all travelling, and render it impracticable for him to proceed until a thaw succeeded to open the communication. During the time of his confinement at *Phari*, he says, such was the severity of the cold, and the injurious effect so rapid a transition from a temperate climate had on the health of himself and his companions, that it left him little room to doubt, if an early change had not fortunately taken place, and permitted his advance, that they must all have fallen victims to the inclemency of the weather.

However, as early as it was possible for him to leave *Phari*, he proceeded by long stages on his journey, and, without encountering any further difficulty, on the 8th of May following, reached *Teeshoo Loomboo*, the capital of *Tibet*. Immediately upon entering the Monastery, he went to the Durbar of the Regent PUNJUR INTINNEE NEMOHEIN to announce his arrival, and the purpose of his commission. Quarters were then allotted for his residence, and an hour fixed for him to wait upon TEESHOO LAMA; who, he was informed the following morning, intended to leave the  
palace

palace to occupy one of his gardens, situated on the plain within sight of the monastery, where it was visible a considerable encampment had been formed. The LAMA quitted his apartment at the first dawn of day, and was lodged in the tents pitched for his accommodation before the sun had risen.

In the course of the morning, at the hour appointed for his admission, POORUNGEER went down to the LAMA's tents. He heard, on entering the gates of the enclosure, that the young LAMA was taking his recreation in the garden, ranging about, which became with him a very favourite amusement. As it was at this time in *Tibet* the warmest part of the year, that he might enjoy the benefit of the air, his attendants had chosen a spot where the trees afforded a complete shade, to place an elevated seat of cushions for the young LAMA, after his exercise, to rest upon. In this situation POORUNGEER found him, when summoned to his presence, attended by the Regent, his Parents, SOORPOON CHOOMBOO, the cup bearer, and the principal officers of the court. After making three obeisances at as remote a distance as it was possible, POORUNGEER approached, and presented to the LAMA, according to the custom of *Tibet*, a piece of white pelong, and then delivered the letters and presents with which he had been charged. The packages were all immediately opened before the LAMA, who had every article brought near to him, and viewed them separately one by one. The letter he took into his own hand, himself broke the seal, and taking from under the cover a string of pearls, which it enclosed, ran them over between his fingers, as they read their rosaries, and then with an arch air placed them by his side, nor would, while the narrator was in his presence, permit any one to take them up. POORUNGEER says the young LAMA regarded him with a very kind and significant look, spoke

to him in the *Tibet* language, and asked him if he had had a fatiguing journey. The interview lasted more than an hour, during all which time the LAMA sat with the utmost composure, not once attempting to quit his seat, nor discovering the least forward uneasiness at his confinement. Tea was twice brought in, and the LAMA drank a cup each time. When ordered to accept his dismissal, POORUNGEER approached the LAMA, and bowing before him, presented his head uncovered to receive his blessing, which the young LAMA gave, by stretching out his hand, and laying it upon his head. He then ordered him, for as long as he resided at *Teeshoo Loomboo*, to come to him once every day.

The following morning POORUNGEER waited upon the regent at his apartments in the palace, to whom, after observing the customary forms of introduction, he delivered his dispatches. After this he visited SOORPOON CHOOMBOO, the LAMA's parents, and others, to whom he was before known, and says he experienced from all quarters the most cordial and kind reception; for they had been long used to consider him as an agent of the government of *Bengal*. He found no change whatever to have ensued in the administration since his attendance upon me in *Tibet*. The country enjoyed perfect tranquillity; and the only event that had taken place of importance in their annals, was the inauguration of the infant LAMA, which happened the preceding year; and as this constitutes a concern of the highest moment, whether considered in a political or religious point of view, being no less than the recognizance in an infant form of their re-generated Immortal Sovereign and Ecclesiastical Supreme, I was induced to bestow more than common pains to trace the ceremonies that attended the celebration of such a great event, conceiving that the novelty of the subject might render the account curious, if even it should be found to contain no information

information of real utility. I shall therefore, without further apology, subjoin the result of my enquiries, premising only that my authority for the description is derived principally from POORUNGLER, and confirmed with some additional particulars, by the concurring reports of a *Gosseyn* who was at the time himself present on the spot.

The Emperor of *China* appears, on this occasion, to have assumed a very conspicuous part, in giving testimony of his respect and zeal for the great religious Father of his Faith. Early in the year 1784 he dispatched ambassadors from the court of *Pekin* to *Teeshoo Loomboo*, to represent their sovereign in supporting the dignity of the High Priest, and do honour to the occasion of the assumption of his office. DALAI LAMA and the Viceroy of *Lassa*, accompanied by all the court, one of the *Chinese* generals stationed at *Lassa* with a part of the troops under his command, two of the four magistrates of the city, the heads of every monastery throughout *Tibet*, and the emperor's ambassadors, appeared at *Teeshoo Loomboo* to celebrate this epocha in their theological institutions. The 28th day of the seventh moon, corresponding nearly, as their year commences with the vernal equinox, to the middle of October 1784, was chosen as the most auspicious for the ceremony of inauguration; a few days previous to which the LAMA was conducted from *Terpaling*, the monastery in which he had passed his infancy, with every mark of pomp and homage that could be paid by an enthusiastic people. So great a concourse, as assembled either from curiosity or devotion, was never seen before; for not a person of any condition in *Tibet* was absent who could join the suite. The procession was hence necessarily constrained to move so slow, that though *Terpaling* is situated at the distance of twenty miles only from *Teeshoo Loomboo*, three days expired in the performance of this short march. The first halt was

made at *Tsondue* ; the second at *Summaar* ; about six miles off whence the most splendid parade was reserved for the LAMA's entry on the third day, the account of which is given me by a person who was present in the procession. The road, he says, was previously prepared by being whitened with a wash, and having piles of stones heaped up, with small intervals between, on either side. The retinue passed between a double row of priests, who formed a street extending all the way from *Summaar* to the gates of the palace. Some of the priests held lighted rods of a perfumed composition, that burn like decayed wood, and emit an aromatic smoke ; the rest were furnished with the different musical instruments they use at their devotions, such as the gong, the cymbal, the hautboy, trumpets, drums, and sea shells, which were all sounded in union with the hymn they chanted. The croud of spectators were kept without the street, and none admitted on the high road but such as properly belonged to, or had a prescribed place in, the procession, which was arranged in the following order.

The van was led by three military commandants, or governors of districts, at the head of 6 or 7000 horsemen, armed with quivers, bows, and matchlocks. In their rear followed the ambassador, with his suite, carrying his diploma, as is the custom of *China*, made up in the form of a large tube, and fastened on his back. Next the *Chinese* general advanced with the troops under his command, mounted and accoutred after their way with fire arms and sabres ; then came a very numerous group, bearing the various standards and insignia of state. Next to them moved a full band of wind and other sonorous instruments ; after which were led two horses, richly caparisoned, each carrying two large circular stoves, disposed like panniers, across the horse's back, and filled with burning aromatic woods.

These

These were followed by a senior priest, called a *Lama*, who bore a box, containing books of their form of prayer and some favourite idols. Next nine sumptuary horses were led, loaded with the LAMA's apparel; after which came the priests immediately attached to the LAMA's person for the performance of daily offices in the temple, amounting to about 700: following them were two men, each carrying on his shoulder a large cylindrical gold insignium, embossed with emblematical figures, (a gift from the Emperor of China.) The *Duhunners* and *Soopoons*, who were employed in communicating addresses, and distributing alms, immediately preceded the LAMA's bier, which was covered with a gaudy canopy, and borne by eight of the sixteen *Chinese* appointed for this service. On one side of the bier attended the Regent, on the other the LAMA's Father. It was followed by the heads of the different monasteries; and as the procession advanced, the priests who formed the street fell in the rear, and brought up the suite, which moved at an extremely slow pace, and about noon was received within the confines of the monastery, amidst an amazing display of colours, the acclamations of the croud, solemn music, and the chanting of their priests.

The LAMA being safely lodged in the palace, the Regent and SOOPHON CHOOMBOO went out, as is customary compliment paid to visitors of high rank on their near approach, to meet and conduct DALAI LAMA and the Viceroy of *Lassa*, who were on the way to *Teeshoo Loomtoo*. Their retinues encountered the following morning at the foot of *Painom* castle, and the next day together entered the monastery of *Teeshoo Loomtoo*, in which both DALAI LAMA and the Viceroy were accommodated during their stay.

The following morning, which was the third after TEESHOO LAMA's arrival, he was carried to the great temple, and about noon seated upon the throne of his progenitors; at which time the Emperor's ambassador delivered his diploma, and placed the presents with which he had been charged at the LAMA's feet.

The three next ensuing days DALAI LAMA met TEESHOO LAMA in the temple, where they were assisted by all the priests in the invocation and public worship of their Gods. The rites then performed completed, as I understand, the business of inauguration. During this interval all who were at the capital were entertained at the public expence, and alms were distributed without reserve. In conformity likewise to previous notice circulated every where for the same space of time, universal rejoicings prevailed throughout *Tibet*. Banners were unfurled on all their fortresses, the peasantry filled up the day with music and festivity, and the night was celebrated by general illuminations. A long period was afterwards employed in making presents and public entertainments to the newly inducted LAMA, who, at the time of his accession to the Musnud, or (if I may use the term) pontificate, of *Teeshoo Loomboo*, was not three years of age. The ceremony was begun by DALAI LAMA, whose offerings are said to have amounted to a greater value, and his public entertainments to have been more splendid, than the rest. The second day was dedicated to the Viceroy of *Lassa*. The third to the *Chinese* General. Then followed the Cullong, or Magistrates of *Lassa*, and the rest of the principal persons who had accompanied DALAI LAMA. After which the Regent of *Teeshoo Loomboo*, and all that were dependent on that government, were severally admitted, according to pre-eminence of rank, to pay their tributes of obedience and respect. As soon as the acknowledgments of all those were

were received who were admissible to the privilege. *TEESHOO LAMA* made, in the same order, suitable returns to each, and the consummation lasted forty days.

Many importunities were used with *DALAI LAMA* to prolong his stay at *Teeshoo Loomboo*, but he excused himself from encumbering the capital any longer with so numerous a concourse of people as attended on his movements, and deeming it expedient to make his absence as short as possible from the seat of his authority, at the expiration of forty days he withdrew with all his suite to *Lassa*, and the Emperor's ambassador received his dismissal to return to *China*; and thus terminated this famous festival.

With respect to the lately-established commercial intercourse, *POORUNGEER* informs me, that though so early, he found himself not the first person who had arrived at *Teeshoo Loomboo* from *Bengal*. Many merchants had already brought their commodities to market, and others followed before he left it. He heard from no quarter any complaint of impediment or loss, and concludes, therefore, that all adventurers met the same easy access and ready aid as he himself had every where experienced. The markets were well-stocked with *English* and *Indian* articles, yet not in so great a degree as to lower the value of commodities below the prices of the two or three last preceding years. Bullion was somewhat reduced in worth in comparison with the year 1783. A pootree, or bulse of gold dust, the same quantity that then sold for twenty-one indermillees, was procurable of a purer quality for nineteen and twenty indermillees. A talent of silver, which was then 500, was 450 indermillees; so that the exchange was much in favour of the trader.



POORUNGEER, during his residence at *Teeshoo Loomboo*, had very frequent interviews with the Regent and the Ministers, and assures me, he found the heartiest dispositions in them to encourage the commercial intercourse established under the auspices of the late Governor General, whose departure, however, the Regent regretted, as the loss of the first friend and ally he became connected with, of, I believe it may be said, any foreign nation; in whom was acknowledged also the original means of opening the communication, and of commencing a correspondence, between the Governments of *Bengal* and *Tibet*; and although it may be observed that, in consequence of his having from the beginning, been used exclusively to address himself to, and acknowledge alone the agents of, Mr. HASTINGS, his attachments to the *English* nation had grown not without a great degree of personality; yet, free from an unworthy capriciousness of temper, he descended not to take advantage of the opening offered by his friend's departure to close the new connection. For such was the respect he had learnt to entertain for our national integrity of character, that, under the apparent conviction our views tended to no scheme of ambition, but were confined merely to objects of utility and curiosity, POORUNGEER assures me, he expressed an anxious desire for continuing with the succeeding Governor General the exercise of those offices of friendship so long supported by his predecessor; and in the hope that his would be met with equal wishes, determined to invite you to join him in preserving the same intercourse of commerce and correspondence, so essentially calculated for the benefit of both countries. In consequence of which the LAMA and the Regent addressed the letters POORUNGEER had the honour to deliver to you, translations of which having, in obedience to your directions, been applied for to your *Persian* translator, I now subjoin them.

*Copy of a Letter from TEESHOO LAMA.*

“ God be praised that the situation of these countries is in peace and  
 “ happiness, and I am always praying at the altar of the Almighty for your  
 “ health and preservation. This is not unknown : you are certainly employ-  
 “ ed in protecting and assisting the whole world, and you promote the good  
 “ and happiness of mankind. We have made no deviation from the union  
 “ and unanimity which existed during the time of the first of nobles Mr.  
 “ HASTINGS and the deceased LAMA ; and may you also grant friendship to  
 “ these countries, and always make me happy with the news of your health,  
 “ which will be the cause of ease to my heart, and confirmation to my soul.  
 “ At this time, as friendly offerings of union and unanimity, I send one  
 “ handkerchief, one ketoo of silver, and one piece of cochin. Let them be  
 “ accepted.”

*From the RAJAH of Teeshoo Loomboo.*

“ God be praised that the situation of these countries is in peace and  
 “ happiness, and I am always praying at the altar of the Almighty for your  
 “ health and preservation. This is not unknown : I am constantly employed  
 “ in promoting the advantage of the subjects and the service of the newly  
 “ seated LAMA, because the newly seated LAMA is not distinct from the de-  
 “ ceased LAMA, and the light of his countenance is exalted. Grant your  
 “ friendship to POORUNGEE Gosseyn.

“ Maintain union, and unanimity, and affection, like the first of no-  
 “ bles, and every day make me happy with the news of your health and  
 “ prosperity and bestow favours like the first of nobles, and make me hap-

“ py with letters, which are causes of consolation. At this time, as friendly offerings of union, and affection, and unanimity, I send one handkerchief, three tolah of gold, and one piece of cochin. Let them be accepted.”

POORUNGEER, having received these dispatches in the beginning of October, after a residence of five months at *Teeshoo Loomboo*, took leave of the LAMA and the regent, and set out on his return, by the same route, he came to *Bengal*. The weather at this season of the year being most extremely favourable for travelling, he experienced no delay or interruption in the course of his journey through *Tibet* and *Bootan*, but arrived at *Rungpore* early in December, whence he proceeded as expeditiously as possible to the Presidency ; where, to his great mortification and concern, he finds, upon his arrival, his affairs involved in great distress ; the little territory his adopted Chela was left in charge of, having, during his absence, been violently invaded by RAAJ CHUND, a neighbouring Zemeendar, and to the amount of fifty begas forcibly taken out of his hands. Prevailed on by his earnest repeated solicitations, I am induced to say for him, that in your justice and favour are his only hopes of relief from his embarrassments ; and he humbly supplicates your protection in restoring and securing him in the possession of his invaded right. The liberty of this intercession, I am confident to think, would be forgiven, were it not in favour of one who has rendered to this Government various useful services ; but as, though of trivial importance, it affords an authentic instance of the encroaching disposition of inferior Zemeendars. Yet another circumstance it may not be improper to point out. The ground alluded to is a part of the land situated upon the western bank of the river opposite Calcutta, that was formerly granted under a Sunnud of this Government to

TEESHOO

TEESHOO LAMA, for the foundation of a temple of worship, and as a resort for such pilgrims of their nation, as might occasionally make visits to the consecrated Ganges.

Having, in conformity to your desires, done my best endeavours literally to translate all the information POORENGIER could give me, I have now only to apologize for the prolixity of the account, which I have been induced to be particularly minute in, as I conceived every circumstance, however trivial, might be in some degree interesting, that tends to illustrate any trait in the national character of a people we are but recently become acquainted with, and with whom in its extended views it has been an object of this Government to obtain a closer alliance.

I will not now presume to intrude longer on your time, by adding any observations on conjectures deducible from the elevated importance your young ally seems rising to, in consequence of the signal respect paid him by the most exalted political characters known to his nation; but beg leave to repeat, that it is with infinite satisfaction I learn from the reports of POORENGIER the flourishing state of the lately projected scheme of trade, to promote which, he assures me, not any thing had been wanting in facility of intercourse: that the adventurers, who had invested their property, had experienced perfect security in conducting their commerce, carried their articles to an exceeding good market, and found the rate of exchange materially in their favour.

Those advantages authorize the inference, that it will no doubt encourage more extensive enterprize; and permit me to add, I derive a confidence from the success of this infant essay, that inspires me with the

strongest hopes, that the commission which your Honourable Board was pleased to commit to my charge, will eventually be productive of essential benefits to the political and commercial interests of the Company.

I have the honour to be,

HONOURABLE SIR,

With the greatest respect,

Your most obedient, faithful,

And most humble Servant,

SAMUEL TURNER.

*Calcutta, February 8, 1786.*

## IX.

## ON THE GODS OF GREECE, ITALY, AND INDIA,

WRITTEN IN 1784, AND SINCE REVISED,

BY THE PRESIDENT.

WE cannot justly conclude, by arguments preceding the proof of facts, that one idolatrous people must have borrowed their deities, rites, and tenets from another; since Gods of all shapes and dimensions may be framed by the boundless powers of imagination, or by the frauds and follies of men, in countries never connected; but, when features of resemblance, too strong to have been accidental, are observable in different systems of polytheism, without fancy or prejudice to colour them and improve the likeness, we can scarce help believing, that some connection has immemorially subsisted between the several nations, who have adopted them: it is my design, in this Essay, to point out such a resemblance between the popular worship of the old *Greeks* and *Italians*, and that of the *Hindus*; nor can there be room to doubt of a great similarity between their strange religions and that of *Egypt*, *China*, *Persia*, *Phrygia*, *Phoenice*, *Syria*; to which perhaps, we may safely add some of the southern kingdoms, and even islands, of *America*: while the *Gothick* system, which prevailed in the northern regions of *Europe*, was not merely similar to those of *Greece* and *Italy*, but almost the same in another dress, with an embroidery of images apparently *Asiatick*. From all this, if it be satisfactorily proved, we may infer a general union or affinity between the most distinguished inhabitants of the primitive world, at the time when they deviated, as they did too early deviate, from the rational adoration of the only true God.

There

There seem to have been four principal sources of all mythology. I. Historical or natural truth has been perverted into fable by ignorance, imagination, flattery, or stupidity; as a king of *Crete*, whose tomb had been discovered in that island, was conceived to have been the God of *Olympus*; and *Minos*, a legislator of that country, to have been his son, and to hold a supreme appellate jurisdiction over departed souls; hence too probably flowed the tale of *Cadmus*, as *Bochart* learnedly traces it; hence beacons or volcanos became one-eyed giants, and monsters vomiting flames; and two rocks, from their appearance to mariners in certain positions, were supposed to crush all vessels attempting to pass between them; of which idle fictions many other instances might be collected from the *Odyssey* and the various *Argonautick* poems. The less we say of *Julian* flars, dedications of princes or warriors, altars raised, with those of *Apollo*, to the basest of men, and divine titles bestowed on such wretches as *Cæsar Octavianus*, the less we shall expose the infamy of grave senators and fine poets, or the brutal folly of the low multitude: but we may be assured, that the mad apotheosis of truly great men, or of little men falsely called great, has been the origin of gross idolatrous errors in every part of the Pagan world. II. The next source of them appears to have been a wild admiration of the heavenly bodies, and, after a time, the systems and calculations of astronomers; hence came a considerable portion of *Egyptian* and *Grecian* fable; the *Sabian* worship in *Arabia*; the *Persian* types and emblems of *Mihr*, or the Sun; and the far extended adoration of the elements and the powers of nature; and hence, perhaps, all the artificial Chronology of the *Chinese* and *Indians*, with the invention of demi-gods and heroes to fill the vacant niches in their extravagant and imaginary periods. III. Numberless Divinities have been created solely by the magick of poetry, whose essential business it is to personify the most abstract

abstract notions, and to place a Nymph or a Genius in every grove, and almost in every flower; hence *Hygieia* and *Jaso*, health and remedy, are the poetical daughters of *Æsculapius*, who was either a distinguished physician, or medical skill personified; and hence *Chloris*, or verdure, is married to the *Zephyr*. IV. The metaphors and allegories of moralists and metaphysicians have been also very fertile in Deities; of which a thousand examples might be adduced from *PLATO*, *CICERO*, and the inventive commentators on *HOMER*, in their pedigrees of the Gods, and their fabulous lessons of morality: the richest and noblest stream from this abundant fountain is the charming philosophical tale of *PSYCHE*, or the *Progress of the Soul*; than which, to my taste, a more beautiful, sublime, and well supported allegory was never produced by the wisdom and ingenuity of man. Hence also the *Indian* *MA'YA'*, or, as the word is explained by some *Hindu* scholars, "the first inclination of the Godhead to diversify himself" (such is their phrase) by creating worlds," is feigned to be the Mother of universal Nature, and of all the inferior Gods; as a *Cashmirian* informed me, when I asked him, why *CA'MA*, or *Love*, was represented as her son; but the word *MA'YA'*, or *Delusion*, has a more subtle and recondite sense in the *Védānta* philosophy, where it signifies the system of *perceptions*, whether of secondary or of primary qualities, which the Deity was believed by *EPICHRMUS*, *PLATO*, and many truly pious men, to raise by his omnipresent spirit in the minds of his creatures; but which had not, in their opinion, any existence independent of mind.

In drawing a parallel between the Gods of the *Indian* and *European* Heathens, from whatever source they were derived, I shall remember, that nothing is less favourable to inquiries after truth than a systematical spirit, and shall call to mind the saying of a *Hindu* writer, "that whoever ob-

"stinately



“ finally adheres to any set of opinions, may bring himself to believe  
 “ that the fiercest sandal-wood is a flame of fire :” this will effectually prevent me from insisting, that such a God of *India* was *the* JUPITER of *Greece*; such, *the* APOLLO; such, *the* MERCURY. In fact, since all the causes of polytheism contributed largely to the assemblage of *Grecian* Divinities, (though BACON reduces them all to refined allegories, and NEWTON to a poetical disguise of true history,) we find many JOVES, many APOLLOS, many MERCURIES, with distinct attributes and capacities: nor shall I presume to suggest more than that, in one capacity or another, there exists a striking similitude between the chief objects of worship in ancient *Greece* or *Italy* and in the very interesting country which we now inhabit.

The comparison, which I proceed to lay before you, must needs be very superficial; partly from my short residence in *Hindustan*, and partly from my want of complete leisure for literary amusements; but principally because I have no *European* book, to refresh my memory of old fables, except the conceited, though not unlearned, work of POMÉY, entitled the *Pantheon*, and that so miserably translated, that it can hardly be read with patience. A thousand more strokes of resemblance might, I am sure, be collected by any who should with that view peruse HESIOD, HYGINUS, CORNUTUS, and the other mythologists; or, which would be a shorter and a pleasanter way, should be satisfied with the very elegant *Syntagmata* of LILIUS GIRALDUS.

Disquisitions concerning the manners and conduct of our species in early times, or indeed at any time, are always curious at least and amusing; but they are highly interesting to such as can say of themselves with CHREMES in the play, “ We are men, and take an interest in all that re-  
 “ lates

“lates to mankind:” They may even be of solid importance in an age, when some intelligent and virtuous persons are inclined to doubt the authenticity of the accounts, delivered by MOSES, concerning the primitive world, since no modes or sources of reasoning can be unimportant, which have a tendency to remove such doubts. Either the first eleven chapters of *Genesis*, all due allowances being made for a figurative Eastern style, are true, or the whole fabrick of our national religion is false; a conclusion, which none of us, I trust, would wish to be drawn. I, who cannot help believing the divinity of the MESSIAH, from the undisputed antiquity and manifest completion of many prophecies, especially those of ISAIAH, in the only person recorded by history, to whom they are applicable, am obliged of course to believe the sanctity of the venerable books, to which that sacred person refers as genuine; but it is not the truth of our national religion, as such, that I have at heart: it is truth itself; and, if any cool unbiafed reasoner will clearly convince me, that MOSES drew his narrative through *Egyptian* conduits from the primeval fountains of *Indian* literature, I shall esteem him as a friend for having weeded my mind from a capital error, and promise to stand among the foremost in assisting to circulate the truth which he has ascertained. After such a declaration, I cannot but persuade myself, that no candid man will be displeased, if, in the course of my work, I make as free with any arguments, that he may have advanced, as I should really desire him to do with any of mine, that he may be disposed to controvert. Having no system of my own to maintain, I shall not pursue a very regular method, but shall take all the Gods, of whom I discourse, as they happen to present themselves; beginning, however, like the *Romans* and the *Hindus*, with JANUS or GANESA.

The titles and attributes of this old *Italian* deity are fully comprized in

two choriambick verses of SUIPITIUS; and a farther account of him from OVID would here be superfluous:

*Jane pater, Jane tuens, dive biceps, biformis,  
O cate rerum fator, O principium deorum !*

“ Father JANUS, all-beholding JANUS, thou divinity with two heads, and  
“ with two forms ; O sagacious planter of all things, and leader of deities !”

He was the God, we see, of *Wisdom* ; whence he is represented on coins with *two*, and on the *Hetruscan* image found at *Falisci*, with *four*, faces ; emblems of prudence and circumspection : thus is GANE'SA, the God of *Wisdom* in *Hindustan*, painted with an *elephant's* head, the symbol of sagacious discernment, and attended by a favourite *rat*, which the *Indians* consider as a wife and provident animal. His next great character (the plentiful source of many superstitious usages) was that, from which he is emphatically styled *the father*, and which the second verse before-cited more fully expresses, *the origin and founder of all things* : whence this notion arose, unless from a tradition that he first built shrines, raised altars, and instituted sacrifices, it is not easy to conjecture ; hence it came however, that his name was invoked before any other God ; that, in the old sacred rites, corn and wine, and, in later times, incense also, were first offered to JANUS ; that the *doors* or *entrances* to private houses were called *Januæ*, and any pervious passage or thorough-fare, in the plural number, *Jani*, or *with two beginnings* ; that he was represented holding a rod, as guardian of *ways*, and a key, as *opening*, not gates only, but *all important works and affairs* of mankind ; that he was thought to preside over the morning, or *beginning of day* ; that, although the *Roman* year began regularly



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regularly with *March*, yet the eleventh month, named *Januarius*, was considered as *first* of the twelve, whence the whole year was supposed to be under his guidance, and opened with great solemnity by the consuls inaugurated in his fane, where his statue was decorated on that occasion with fresh laurel; and, for the same reason, a solemn denunciation of war, than which there can hardly be a more momentous national act, was made by the military consul's opening the gates of his temple with all the pomp of his magistracy. The twelve altars and twelve chapels of *JANUS* might either denote, according to the general opinion, that he leads and governs twelve months; or that, as he says of himself in *OVID*, all entrance and access must be made through him to the principal Gods, who were, to a proverb, of the same number. We may add, that *JANUS* was imagined to preside over infants at their birth, or the *beginning* of life.

The *Indian* divinity has precisely the same character: all sacrifices and religious ceremonies, all addresses even to superiour Gods, all serious compositions in writing, and all worldly affairs of moment, are begun by pious *Hindus* with an invocation of *GANE'SA*; a word composed of *isa*, the governor or leader, and *gana*, or a company of deities, nine of which companies are enumerated in the *Anurash*. Instances of opening business auspiciously by an ejaculation to the *JANUS* of *India* (if the lines of resemblance here traced will justify me in so calling him) might be multiplied with ease. Few books are begun without the words "*salutation to GANE'S*," and he is first invoked by the *Brahmans*, who conduct the trial by ordeal, or perform the ceremony of the *homa*, or sacrifice to fire: *M. SONNERAT* represents him as highly revered on the Coast of *Coromandel*; "where the *Indians*, he says, would not on any account build a house, without having placed on the ground an image of this deity.

“ which they sprinkle with oil and adorn every day with flowers; they  
 “ set up his figure in all their temples, in the streets, in the high roads,  
 “ and in open plains at the foot of some tree; so that persons of all ranks  
 “ may invoke him, before they undertake any business, and travellers wor-  
 “ ship him, before they proceed on their journey.” To this I may add,  
 from my own observation, that in the commodious and useful town, which  
 now rises at *Dharmáranja* or *Gayá*, under the auspices of the active and  
 benevolent THOMAS LAW, Esq. collector of *Rotas*, every new-built house,  
 agreeably to an immemorial usage of the *Hindus*, has the name of CANE'SA,  
 superscribed on its door; and, in the old town, his image is placed over the  
 gates of the temples.

We come now to SATURN, the oldest of the pagan Gods, of whose  
 office and actions much is recorded. The jargon of his being the son of  
 Earth and of Heaven, who was the son of the Sky and the Day, is purely  
 a confession of ignorance, who were his parents or who his predecessors;  
 and there appears more sense in the tradition said to be mentioned by the  
 inquisitive and well-informed PLATO, “ that both SATURN or *time*, and  
 “ his consort CYBELE, or the *Earth*, together with their attendants, were  
 “ the children of *Ocean* and *TETHIS*, or, in less poetical language, sprang  
 “ from the waters of the great deep.” CERES, the goddess of harvests,  
 was, it seems, their daughter; and VIRGIL describes “ the mother and  
 “ nurse of all as crowned with turrets, in a car drawn by lions, and exult-  
 “ ing in her hundred grand-sons, all divine, all inhabiting splendid celestial  
 “ mansions.” As the God of time, or rather as *time* itself personified, SA-  
 TURN was usually painted by the heathens holding a scythe in one hand,  
 and, in the other, a snake with its tail in its mouth, the symbol of perpetual  
 cycles and revolutions of ages: he was often represented in the act of de-  
 vouring

vouring years, in the form of children, and, sometimes, encircled by the seasons appearing like boys and girls. By the *Latins* he was named SATURNUS; and the most ingenious etymology of that word is given by FESTUS the grammarian, who traces it, by a learned analogy to many similar names, *à satu*, from planting, because, when he reigned in *Italy*, he introduced and improved agriculture: but his distinguishing character, which explains, indeed, all his other titles and functions, was expressed allegorically by the stern of a ship or galley on the reverse of his ancient coins; for which OVID assigns a very unsatisfactory reason, “because the “divine stranger arrived in a ship on the *Italian* coast;” as if he could have been expected on horse-back or hovering through the air.

The account, quoted by POMPEY from ALEXANDER POLYHISTOR, casts a clearer light, if it really came from genuine antiquity, on the whole tale of SATURN; “that he predicted an extraordinary fall of rain, and “ordered the construction of a vessel, in which it was necessary to secure “men, beasts, birds, and reptiles from a general inundation.”

Now it seems not easy to take a cool review of all these testimonies concerning the birth, kindred, offspring, character, occupations, and entire life of SATURN, without assenting to the opinion of BOETIUS, or admitting it at least to be highly probable, that the fable was raised on the true history of NOAH; from whose flood a new period of *time* was computed, and a new series of ages may be said to have sprung; who rose fresh, and, as it were, newly born from the waves; whose wife was in fact the universal mother, and, that the earth might soon be re-peopled, was early blessed with numerous and flourishing descendants: if we produce, therefore, an *Indian* king of divine birth, eminent for his piety and bene-

ficence,



ficence, whose story seems evidently to be that of NOAH disguised by *Asiatic* fiction, we may safely offer a conjecture, that he was also the same personage with SATURN. This was MENU, or SATYAVRATA, whose patronymick name was VAIVASWATA, or Child of the SUN; and whom the *Indians* not only believe to have reigned over the whole world in the earliest age of their chronology, but to have resided in the country of *Dravira*, on the coast of the Eastern *Indian* Peninsula: the following narrative of the principal event in his life I have literally translated from the *Bhāgavat*; and it is the subject of the first *Purāna*, entitled that of the *Matsya*, or *Fish*.

“ Desiring the preservation of herds, and of *Brāhmans*, of genii and  
 “ virtuous men, of the *Ṛṣas*, of law, and of precious things, the lord of  
 “ the universe assumes many bodily shapes; but, though he pervades, like  
 “ the air, a variety of beings, yet he is himself unvaried, since he has no  
 “ quality subject to change. At the close of the last *Calpa*, there was a general  
 “ destruction occasioned by the sleep of BRAHMA'; whence his creatures  
 “ in different worlds were drowned in a vast ocean. BRAHMA', being  
 “ inclined to slumber, desiring repose after a lapse of ages, the strong  
 “ demon HAYAGRI'VA came near him, and stole the *Ṛṣas*, which had  
 “ flowed from his lips. When HIRI, the preserver of the universe, discovered  
 “ this deed of the Prince of *Danavas*, he took the shape of a  
 “ minute fish, called *sap'hari*. A holy king, named SATYAVRATA,  
 “ then reigned; a servant of the spirit, which moved on the waves, and so  
 “ devout, that water was his only sustenance. He was the child of the  
 “ Sun, and, in the present *Calpa*, is invested by NARA'YAN in the office  
 “ of *Menu*, by the name of SRA'DDHAD'E'VA, or the God of Obsequies.  
 “ One day, as he was making a libation in the river *Critamālā*, and  
 “ held water in the palm of his hand, he perceived a small fish moving  
 in

“ in it. The king of *Dravira* immediately dropped the fish into the river  
 “ together with the water, which he had taken from it; when the *sap'harî*  
 “ thus pathetically addressed the benevolent monarch: How canst thou,  
 “ O king, who showest affection to the oppressed, leave me in this river-  
 “ water, where I am too weak to resist the monsters of the stream, who  
 “ fill me with dread?” He, not knowing who had assumed the form  
 “ of a fish, applied his mind to the preservation of the *sap'harî*, both  
 “ from good nature and from regard to his own soul; and, having heard its  
 “ very suppliant address, he kindly placed it under his protection in a  
 “ small vase full of water; but, in a single night, its bulk was so increased,  
 “ that it could not be contained in the jar, and thus again addressed the il-  
 “ lustrious Prince: “ I am not pleased with living miserably in this little  
 “ vase; make me a large mansion, where I may dwell in comfort.” The  
 “ king, removing it thence, placed it in the water of a cistern; but it  
 “ grew three cubits in less than fifty minutes, and said: “ O king, it  
 “ pleases me not to stay vainly in this narrow cistern: since thou hast  
 “ granted me an asylum, give me a spacious habitation.” He then remov-  
 “ ed it, and placed it in a pool, where, having ample space around its bo-  
 “ dy, it became a fish of considerable size. “ This abode, O king, is not  
 “ convenient for me, who must swim at large in the waters: exert thyself  
 “ for my safety; and remove me to a deep lake:” Thus addressed, the  
 “ pious monarch threw the suppliant into a lake, and, when it grew of  
 “ equal bulk with that piece of water, he cast the vast fish into the sea.  
 “ When the fish was thrown into the waves, he thus again spoke to SA-  
 “ TYAVRATA: “ here the horned sharks, and other monsters of great  
 “ strength will devour me; thou shouldst not, O valiant man, leave me in  
 “ this ocean.” Thus repeatedly deluded by the fish, who had addressed  
 “ him with gentle words, the king said: “ who art thou, that beguilest me

" in that assumed shape? Never before have I seen or heard of so  
 " prodigious an inhabitant of the waters, who, like thee, has filled up,  
 " in a single day, a lake an hundred leagues in circumference. Surely, thou  
 " art BHAGAVAT, who appearest before me; the great HERRI, whose  
 " dwelling was on the waves; and who now, in compassion to thy ser-  
 " vants, bearest this form of the natives of the deep. Salutation and praise  
 " to thee, O first male, the lord of creation, of preservation, of destruction!  
 " Thou art the highest object, O supreme ruler, of us thy adorers, who  
 " piously seek thee. All thy delusive descents in this world give exist-  
 " ence to various beings: yet I am anxious to know, for what cause that  
 " shape has been assumed by thee. Let me not, O lotos-eyed, approach  
 " in vain the feet of a deity, whose perfect benevolence has been extend-  
 " ed to all; when thou hast shown us, to our amazement, the appearance  
 " of other bodies, not in reality existing, but successively exhibited." The  
 " lord of the universe, loving the pious man, who thus implored him, and  
 " intending to preserve him from the sea of destruction, caused by the de-  
 " pravity of the age, thus told him how he was to act. " In seven days  
 " from the present time, O thou tamer of enemies, the three worlds  
 " will be plunged in an ocean of death; but, in the midst of the destroy-  
 " ing waves, a large vessel, sent by me for thy use, shall stand before thee.  
 " Then shalt thou take all medicinal herbs, all the variety of feeds; and,  
 " accompanied by seven Saints, encircled by pairs of all brute animals,  
 " thou shalt enter the spacious ark and continue in it, secure from the  
 " flood on one immense ocean without light, except the radiance of thy  
 " holy companions. When the ship shall be agitated by an impetuous  
 " wind, thou shalt fasten it with a large sea-serpent on my horn; for I  
 " will be near thee: drawing the vessel, with thee and thy attendants, I will  
 " remain on the ocean, O chief of men, until a night of BRAHMA' shall be  
 " completely

“ completely ended. Thou shalt then know my true greatness, rightly  
 “ named the supreme Godhead; by my favour, all thy questions shall be  
 “ answered, and thy mind abundantly instructed.” ‘ HERI, having thus  
 ‘ directed the monarch, disappeared; and SATYAVRATA humbly waited  
 ‘ for the time, which the ruler of our senses had appointed. The pious  
 ‘ king, having scattered toward the east the pointed blades of the grass  
 ‘ *darbha*, and turning his face toward the north, sat meditating on the  
 ‘ feet of the God, who had borne the form of a fish. The sea, overwhelm-  
 ‘ ing its shores, deluged the whole earth; and it was soon perceived to  
 ‘ be augmented by showers from immense clouds. He, still meditating on  
 ‘ the command of BHAGAVAT, saw the vessel advancing, and entered it  
 ‘ with the chiefs of *Bráhmans*, having carried into it the medicinal creepers,  
 ‘ and conformed to the directions of HERI. The saints thus addressed him :  
 “ O king, meditate on CE’SAVA; who will surely deliver us from this  
 “ danger, and grant us prosperity.” ‘ The God, being invoked by the  
 ‘ monarch, appeared again distinctly on the vast ocean in the form of a  
 ‘ fish, blazing like gold, extending a million of leagues, with one stupen-  
 ‘ dous horn; on which the king, as he had before been commanded by  
 ‘ HERI, tied the ship with a cable made of a vast serpent, and happy  
 ‘ in his preservation, stood praising the destroyer of MADHU. When the  
 ‘ monarch had finished his hymn, the primeval male, BHAGAVAT, who  
 ‘ watched for his safety on the great expanse of water, spoke aloud to his  
 ‘ own divine essence, pronouncing a sacred *Purána*, which contained the  
 ‘ rules of the *Sáné’hya* philosophy: but it was an infinite mystery to be  
 ‘ concealed within the breast of SATYAVRATA; who, sitting in the vessel  
 ‘ with the saints, heard the principle of the soul, the Eternal Being, pro-  
 ‘ claimed by the preserving power. Then HERI, rising together with  
 ‘ BRAHMA’, from the destructive deluge, which was abated, slew the de-

‘mon HAYAGRI’VA, and recovered the sacred books. SATYAVRATA, ‘instructed in all divine and human knowledge, was appointed in the ‘present *Calpa*, by the favour of VISHNU, the seventh MENU, surnamed ‘VAIVASWATA: but the appearance of a horned fish to the religious ‘monarch was *Máyá*, or delusion; and he who shall devoutly hear this ‘important allegorical narrative, will be delivered from the bondage of ‘sin.’

This epitome of the first *Indian* History, that is now extant, appears to me very curious and very important; for the story, though whimsically dressed up in the form of an allegory, seems to prove a primeval tradition in this country of the *universal deluge* described by MOSES, and fixes consequently the *time* when the genuine *Hindu* Chronology actually begins. We find, it is true, in the *Purán*, from which the narrative is extracted, *another deluge*, which happened towards the close of the *third* age, when YUDHISHTH’IR was labouring under the persecution of his inveterate foe DURYODHAN, and when CRISHNA, who had recently become incarnate for the purpose of succouring the pious, and of destroying the wicked, was performing wonders in the country of *Mat’hurá*; but the second flood was merely *local*, and intended only to affect the people of *Vraja*: they, it seems had offended INDRA, the God of the firmament, by their enthusiastick adoration of the wonderful child, “ who lifted up “ the mountain *Góverdhená*, as if it had been a flower, and, by sheltering “ all the herdsmen and shepherdesses from the storm, convinced INDRA “ of his supremacy.” That the *Satya*, or (if we may venture so to call it) the *Saturnian*, age was, in truth, the age of the *general flood*, will appear from a close examination of the ten *Avatárs*, or *descents*, of the deity in his capacity of preserver; since of the four, which are declared

to have happened in the *Satya yug*, the *three first* apparently relate to some stupendous convulsion of our globe from the fountains of the deep, and the fourth exhibits the miraculous punishment of pride and impiety: First, as we have shown, there was, in the opinion of the *Hindus*, an interposition of Providence to preserve a devout person and his family (for all the *Pandits* agree, that his wife, though not named, must be understood to have been saved with him) from an inundation, by which all the wicked were destroyed: next, the power of the deity descends in the form of a *Boar*, the symbol of strength, to draw up and support on his tusks the whole earth, which had been sunk beneath the ocean: thirdly, the same power is represented as a *tortoise* sustaining the globe, which had been convulsed by the violent assaults of demons, while the Gods churned the sea with the mountain *Mandar*, and forced it to disgorge the sacred things and animals, together with the water of life, which it had swallowed. These three stories relate, I think, to the same event, shadowed by a moral, a metaphysical, and an astronomical, allegory; and all three seem connected with the hieroglyphical sculptures of the old *Egyptians*. The fourth *Avatár* was a *lion* issuing from a bursting column of marble to devour a blaspheming monarch, who would otherwise have slain his religious son; and of the remaining six, not one has the least relation to a deluge. The three which are ascribed to the *Trétá-yug*, when tyranny and irreligion are said to have been introduced, were ordained for the overthrow of tyrants, or, their natural types, giants with a thousand arms, formed for the most extensive oppression: and, in the *Dwáparayug*, the incarnation of *CRISHNA* was partly for a similar purpose, and partly with a view to thin the world of unjust and impious men, who had multiplied in that age, and began to swarm on the approach of the *Caliyug*, or the age of contention and baseness. As to *BUDDHA*,

he seems to have been a reformer of the doctrines contained in the *Vedas*; and, though his good nature led him to censure those ancient books, because they enjoined sacrifices of cattle, yet he is admitted as the ninth *Avatár* even by the *Bráhmans* of *Cási*, and his praises are sung by the poet JAYADE'VA: his character is in many respects very extraordinary; but, as an account of it belongs rather to history than to mythology, it is reserved for another dissertation. The tenth *Avatár*, we are told, is yet to come, and is expected to appear mounted (like the crowned conqueror in the *Apocalyps*) on a white horse, with a cimeter blazing like a comet, to mow down all incorrigible and impenitent offenders who shall then be on earth.

These four *Yugs* have so apparent an affinity with the *Grecian* and *Roman* ages, that one origin may be naturally assigned to both systems: the first in both is distinguished as abounding in *gold*, though *Satya* mean *truth* and *probity*, which were found, if ever, in the times immediately following so tremendous an exertion of the divine power as the destruction of mankind by a general deluge; the next is characterized by *silver*; and the third, by *copper*; though their usual names allude to proportions imagined in each between vice and virtue: the present, or *earthen*, age, seems more properly discriminated than by *iron*, as in ancient *Europe*; since that metal is not baser or less useful, though more common, in our times, and consequently less precious, than copper; while mere *earth* conveys an idea of the lowest degradation. We may here observe, that the true History of the World seems obviously divisible into *four* ages or periods; which may be called, first, the *Diluvian*, or purest age; namely, the times preceding the deluge, and those succeeding it till the mad introduction of idolatry at *Babel*; next, the *Patriarchal*, or pure

pure, age; in which, indeed, there were mighty hunters of beasts and of men, from the rise of patriarchs in the family of SEM, to the simultaneous establishment of great empires by the descendants of his brother HA'M; thirdly, the *Mosaick*, or less pure, age; from the legation of MOSES, and during the time when his ordinances were comparatively well-observed and uncorrupted; lastly, the *prophetical*, or *impure*, age, beginning with the vehement warnings given by the prophets to apostate kings and degenerate nations, but still subsisting, and to subsist, until all genuine prophecies shall be fully accomplished. The duration of the historical ages must needs be very unequal and disproportionate; while that of the *Indian Yugs* is disposed so regularly and artificially, that it cannot be admitted as natural or probable. Men do not become reprobate in a geometrical progression, or at the termination of regular periods; yet so well-proportioned are the *Yugs*, that even the length of human life is diminished, as they advance, from an hundred thousand years in a subdecuple ratio; and as the number of principal *Avatárs* in each decreases arithmetically from four, so the number of years in each decreases geometrically, and altogether constitute the extravagant sum of four million three hundred and twenty thousand years, which aggregate, multiplied by seventy-one, is the period in which every *MENU* is believed to preside over the world. Such a period, one might conceive, would have satisfied ARCHYTAS, the *measurer of sea and earth, and the numberer of their sands*, or ARCHIMEDES, who invented a notation that was capable of expressing the number of them; but the comprehensive mind of an *Indian* chronologist has no limits; and the reigns of fourteen *MENUS* are only a single day of BRAHMA', fifty of which days have elapsed, according to the *Hindus*, from the time of the creation. That all this puerility, as it seems at first view, may be only an astronomical riddle, and allude to the apparent revolution of the fixed stars, of which the *Bráhmans* made a mystery,

I readily



I readily admit, and am even inclined to believe; but so technical an arrangement excludes all idea of serious history. I am sensible how much these remarks will offend the warm advocates for *Indian* antiquity; but we must not sacrifice truth to a base fear of giving offence. That the *Vedas* were actually written before the flood, I shall never believe; nor can we infer, from the preceding story, that the learned *Hindus* believe it; for the allegorical slumber of BRAHMA', and the theft of the sacred books, mean only, in simpler language, that *the human race was become corrupt*; but that the *Vedas* are very ancient, and far older than other *Sanscrit* compositions, I will venture to assert from my own examination of them, and a comparison of their style with that of the *Puráns* and the *Dharma Sástra*. A similar comparison justifies me in pronouncing, that the excellent law-book ascribed to SWAYAMBHÚVA MENU, though not even pretended to have been written by him, is more ancient than the BHA'GAVAT; but that it was composed in the first age of the world, the *Bráhmans* would find it hard to persuade me; and the date, which has been assigned to it, does not appear in either of the two copies, which I possess, or in any other that has been collated for me: in fact, the supposed date is comprized in a verse, which flatly contradicts the work itself; for it was not MENU who composed the system of law, by the command of his father BRAHMA', but a holy personage, or demigod, named BHṚIGU, who revealed to men what MENU had delivered at the request of him and other saints or patriarchs. In the *Mánava Sástra*, to conclude this digression, the measure is so uniform and melodious, and the style so perfectly *Sanscrit*, or *polished*, that the book must be more modern than the scriptures of MOSES, in which the simplicity, or rather nakedness, of the *Hebrew* dialect, metre, and style, must convince every unbiassed man of their superior antiquity.

I leave etymologists, who decide every thing, to decide whether the word *MENU*, or, in the nominative case, *MENUS*, has any connexion with *MINOS*, the lawgiver, and supposed son of *JOVE*. The *Cretans*, according to *DIONORUS* of *Sicily*, used to feign, that most of the great men, who had been deified in return for the benefits which they had conferred on mankind, were born in their island; and hence a doubt may be raised, whether *MINOS* was really a *Cretan*. The *Indian* legislator was the first, not the seventh, *MENU*, or *SATYAVRATA*, whom I suppose to be the *SATURN* of *Italy*: part of *SATURN*'s character, indeed, was that of a great lawgiver;

Qui genus indocile ac dispersum montibus altis  
Composuit, legesque dedit;

and we may suspect that all the fourteen *MENUS* are reducible to one, who was called *NUM* by the *Arabs*, and probably by the *Hebrews*; though we have disguised his name by an improper pronunciation of it. Some near relation between the seventh *MENU* and the *Grecian MINOS* may be inferred from the singular character of the *Hindu* god, *YAMA*, who was also a child of the Sun, and thence named *VAIVASWATA*: he had too the same title with his brother, *SRA'DDHADHVA*. Another of his titles was *DHARMARA'JA*, or *King of Justice*; and a third, *PITRIPATI*, or *Lord of the Patriarchs*; but he is chiefly distinguished as judge of departed souls; for the *Hindus* believe, that when a soul leaves its body, it immediately repairs to *Yamapur*, or the city of *YAMA*, where it receives a just sentence from him, and either ascends to *Swerga*, or the first heaven; or is driven down to *Narac*, the region of serpents; or assumes on earth the form of some animal, unless its offence had been such, that it

might

ought to be condemned to a vegetable, or even to a mineral, prison. Another of his names is very remarkable; I mean that of *Ca'la*, or *time*, the idea of which is intimately blended with the characters of SATURN and of NOAH; for the name CRONOS has a manifest affinity with the word *chronos*, and a learned follower of ZERA'TUSHT assures me, that, in the books which the the *Behdins* hold sacred, mention is made of an *universal inundation*, there named the deluge of TIME.

It having been occasionally observed, that CERES was the poetical daughter of SATURN, we cannot close this head without adding, that the *Hindus* also have their Goddess of Abundance, whom they usually call LACSHMI', and whom they consider as the daughter (not of MENU, but) of BHRIGU, by whom the first code of sacred Ordinances was promulgated. She is also named PEDMA' and CAMALA', from the sacred lotos, or *Nymphæa*; but her most remarkable name is SRI', or, in the first case, SRI's, which has a resemblance to the *Latin*, and means *fortune* or *prosperity*. It may be contended, that, although LACSHMI' may be figuratively called the CERES of *Hindustan*, yet any two or more idolatrous nations, who subsisted by agriculture, might naturally conceive a Deity to preside over their labours, without having the least intercourse with each other; but no reason appears why two nations should concur in supposing that Deity to be a female: one, at least, of them would be more likely to imagine, that the *Earth* was a Goddess, and that the God of Abundance rendered her fertile. Besides, in very ancient temples near *Gayâ*, we see images of LACSHMI', with full breasts, and a cord twisted under her arm like a *horn of plenty*, which look very much like the old *Grecian* and *Roman* figures of CERES.





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The fable of SATURN having been thus analysed, let us proceed to his descendants; and begin, as the Poet advises, with JUPITER, whose supremacy, thunder, and libertinism every boy learns from OVID; while his great offices of Creator, Preserver, and Destroyer, are not generally considered in the systems of *European* mythology. The *Romans* had, as we have before observed, many JUPITERS, one of whom was only the *Firmament* personified, as ENNIUS clearly expresses it:

Aspice hoc sublime candens, quem invocant omnes *Jovem*.

This JUPITER or DIESPITER is the *Indian* God of the visible heavens, called INDRA, or the *King*, and DIVESPETIR, or *Lord of the Sky*, who has also the character of the *Roman* GENIUS, or Chief of the good spirits; but most of his epithets in *Sanscrit* are the same with those of the *Ennian* JOVE. His consort is named SACHI'; his celestial city, *Amarāvati*; his palace, *Vajrayanta*; his garden, *Nandana*; his chief elephant, *Airārat*; his charioteer, MA'TALI; and his weapon, *Vajra*, or the thunderbolt: he is the regent of winds and showers, and, though the East is peculiarly under his care, yet his *Olympus* is *Méru*, or the north pole allegorically represented as a mountain of gold and gems. With all his power he is considered as a subordinate Deity, and far inferior to the *Indian* Triad, BRAHMA', VINHNU, and MAHA'DEVA or SIVA, who are three *forms* of one and the same Godhead: thus the principal divinity of the *Greeks* and *Latins*, whom they called ZEUS and JUPITER with irregular inflexions DIOS and JOVIS, was not merely *Fulminator*, the Thunderer, but, like the destroying power of *India*, MAGNUS DIVUS, ULTOR, GENITOR; like the preserving power, CONSERVATOR, SOTER, OPITULUS, ALTOR, RUMINUS, and, like the creating power, the *Giver of Life*; an attribute, which I mention

here on the authority of CORNUTUS, a consummate master of mythological learning. We are advised by PLATO himself to search for the roots of *Greek* words in some barbarous, that is, foreign, soil; but, since I look upon etymological conjectures as a weak basis for historical inquiries, I hardly dare suggest, that ZEV, SIV, and JOV, are the same syllable differently pronounced: it must, however be admitted, that the *Greeks*, having no palatal *sigma*, like that of the *Indians*, might have expressed it by their *zéta*, and that the initial letters of *zugon* and *jugum* are (as the instance proves) easily interchangeable.

Let us now descend, from these general and introductory remarks, to some particular observations on the resemblance of ZEUS or JUPITER to the triple divinity VISHNU, SIVA, BRAHMA'; for that is the order, in which they are expressed by the letters A, U, and M, which coalesce and form the mystical word O'M; a word, which never escapes the lips of a pious *Hindu*, who meditates on it in silence: whether the *Egyptian* ON, which is commonly supposed to mean the Sun, be the *Sanscrit* monosyllable, I leave others to determine. It must always be remembered, that the learned *Indians*, as they are instructed by their own books, in truth acknowledge only One Supreme Being, whom they call BRAHME, or THE GREAT ONE in the neuter gender: they believe his Essence to be infinitely removed from the comprehension of any mind but his own; and they suppose him to manifest his power by the operation of his divine spirit, whom they name VISHNU, the *Pervader*, and NA'RA'YAN, or *Moving on the waters*, both in the masculine gender, whence he is often denominated the *First Male*; and by this power they believe, that the whole order of nature is preserved and supported; but the *Védántis*, unable to form a distinct idea of brute matter independent of mind, or to conceive  
that







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ब्रह्मारेविश्वनाम्नः BRAHMA



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आदिज्ञानात्मविष्णुः VISHNU

that the work of Supreme Goodness was left a moment to itself, imagine that the Deity is ever present to his work, and constantly supports a series of perceptions, which, in one sense, they call *illusory*, though they cannot but admit the *reality* of all created forms, as far as the happiness of creatures can be affected by them. When they consider the divine power exerted in *creating*, or in giving existence to that which existed not before, they call the Deity BRAHMA' in the masculine gender also; and, when they view him in the light of *Destroyer*, or rather *Changer* of forms, they give him a thousand names, of which SIVA, I'SA or I'SWARA, RUDRA, HARA, SAMBHU, and MAHA'DE'VA or MAHE'SA, are the most common. The first operations of these three Powers are variously described in the different *Purána's* by a number of allegories, and from them we may deduce the *Ionian Philosophy* of *primeval water*, the doctrine of the Mundane Egg, and the veneration paid to the *Nymphæa*, or *Lotos*, which was anciently revered in *Egypt*, as it is at present in *Hindustán*, *Tibet*, and *Népal*: the *Tibetians* are said to embellish their temples and altars with it, and a native *Népal* made prostrations before it on entering my study, where the fine plant and beautiful flowers lay for examination. Mr. HOLWELL, in explaining his first plate, supposes BRAHMA' to be floating on a leaf of *betel* in the midst of the abyss; but it was manifestly intended by a bad painter for a lotos-leaf, or for that of the *Indian fig-tree*; nor is the species of pepper, known in *Bengal* by the name of *Tám-túla*, and on the Coast of *Malabar* by that of *betel*, held sacred, as he asserts, by the *Hindus*, or necessarily cultivated under the inspection of *Bráhmans*; though, as the vines are tender, all the plantations of them are carefully secured, and ought to be cultivated by a particular tribe of *Súdras*, who are thence called *Tám-búli's*.

That *water* was the primitive element and first work of the Creative Power, is the uniform opinion of the *Indian* Philosophers; but,\* as they give so particular an account of the general deluge and of the Creation, it can never be admitted, that their whole system arose from traditions concerning the flood only, and must appear indubitable, that their doctrine is in part borrowed from the opening of *Birāsit* or *Genesis*, than which a sublimer passage, from the first word to the last, never flowed or will flow from any human pen: “*In the beginning God created the*  
“*heavens and the earth.—And the earth was void and waste, and darkness*  
“*was on the face of the deep, and the Spirit of God moved upon the face*  
“*of the waters; and God said: Let Light be—and Light was.*” The sublimity of this passage is considerably diminished by the *Indian* paraphrase of it, with which *MENU*, the son of *BRAHMA*’, begins his address to the sages, who consulted him on the formation of the universe: “*This*  
“*world, says he, was all darkness, undiscernible, undistinguishable, alto-*  
“*gether as in a profound sleep; till the self-existent invisible God, mak-*  
“*ing it manifest with five elements and other glorious forms, perfectly*  
“*dispelled the gloom. He, desiring to raise up various creatures by an*  
“*emanation from his own glory, first created the waters, and impressed*  
“*them with a power of motion: by that power was produced a golden*  
“*Egg, blazing like a thousand suns, in which was born BRAHMA*’, self-  
“*existing, the great parent of all rational beings. The waters are called*  
“*nāīā, since they are the offspring of NERA (or I’SWARA); and thence*  
“*was NA’RA’YANA named, because his first ayana, or moving, was on*  
“*them.*

“*THAT WHICH IS, the invisible cause, eternal, self-existing, but un-*  
“*perceived, becoming masculine from neuter, is celebrated among all*  
“*creatures*

" creatures by the name of BRAHMA'. That God, having dwelled in the  
 " Egg, through revolving years, Himself meditating on Himself, divided it  
 " into two equal parts; and from those halves formed the heavens and the  
 " earth, placing in the midst the subtil ether, the eight points of the world,  
 " and the permanent receptacle of waters."

To this curious description, with which the *Mánava Sástra* begins, I cannot refrain from subjoining the four verses, which are the text of the *Bhágavat*, and are believed to have been pronounced by the Supreme Being to BRAHMA': the following version is most scrupulously literal\*.

" Even I was even at first, not any other thing; that, which exists, unper-  
 " ceived; supreme: afterwards I AM THAT WHICH IS; and he, who must  
 " remain, am I.

" Except the FIRST CAUSE, whatever may appear, and may not appear,  
 " in the mind, know that to be the mind's MA'YA', (or *Delusion*) as light, as  
 " darkness.

" As the great elements are in various beings, entering, yet not entering,  
 " (that is, pervading, not destroying) thus am I in them, yet not in  
 " them.

" Even thus far may inquiry be made by him, who seeks to know the  
 " principle of mind, in union and separation, which must be EVERY WHERE  
 " ALWAYS."

\* See the Original, p. 33. Plate IV.

Wild and obscure as these ancient verses must appear in a naked verbal translation, it will perhaps be thought by many, that the poetry or mythology of *Greece* or *Italy* afford no conceptions more awfully magnificent: yet the brevity and simplicity of the *Mosaick* diction are unequalled.

As to the creation of the world, in the opinion of the *Romans*, OVID, who might naturally have been expected to describe it with learning and elegance, leaves us wholly in the dark, *which of the Gods was the actor in it*: other mythologists are more explicit; and we may rely on the authority of CORNUTUS, that the old *European* heathens considered Jove (not the son of SATURN, but of the *Ether*, that is of an unknown parent) as the great *Life-giver*, and *Father of Gods and men*; to which may be added the *Orphean* doctrine, preserved by PROCLUS, that “the abyfs and empyreum, the “earth and sea, the Gods and Goddesfes, were produced by ZEUS or JUPITER.” In this character he corresponds with BRAHMA'; and, perhaps, with that god of the *Babylonians*, (if we can rely on the accounts of their ancient religion) who, like BRAHMA', reduced the universe to order, and, like BRAHMA', *lost his head*, with the blood of which new animals were instantly formed: I allude to the common story, the meaning of which I cannot discover, that BRAHMA' had five heads, till one of them was cut off by NA'RA'YA'N.

That, in another capacity, Jove was the *Helper* and *Supporter* of all, we may collect from his old *Latin* epithets, and from CICERO, who informs us, that his usual name is a contraction of *Juvans Pater*; an etymology, which shows the idea entertained of his character, though we may have some doubt of its accuracy. CALLIMACHUS, we know, addresses him as *the bestower of all good, and of security from grief*; and, since nei-  
ther

ther wealth without virtue, nor virtue without wealth, give complete happiness, he prays, like a wife poet, for both. An *Indian* prayer for riches would be directed to LACSHMI', the wife of VISHNU, since the *Hindu* goddesses are believed to be the powers of their respective lords: as to CUVE'RA, the *Indian* PLUTUS, one of whose names is *Paulastya*, he is revered, indeed, as a magnificent Deity, residing in the palace of *Alacá*, or borne through the sky in a splendid car, named *Pushpaca*, but is manifestly subordinate, like the other seven genii, to the three principal Gods, or rather to the principal God considered in three capacities. As the soul of the world, or the pervading mind, so finely described by VIRGIL, we see JOVE represented by several *Roman* poets; and with great sublimity by LUCAN in the known speech of CATO concerning the *Anmonian* oracle, "JUPITER is, wherever we look, " wherever we move." This is precisely the *Indian* idea of VISHNU, according to the four verses above exhibited: not that the *Bráhmans* imagine their male divinity to be the divine *Essence* of the great one, which they declare to be wholly incomprehensible; but, since the power of preserving created things <sup>1</sup> a superintending providence, belongs eminently to the Godhead, they hold that power to exist transcendently in the preserving member of the Triad, whom they suppose to be EVERY WHERE ALWAYS, not in substance, but in spirit and energy: here, however, I speak of the *Varáhnas'*: for the *Saua's* ascribe a sort of pre-eminence to SIVA, whose attributes are now to be concisely examined.

It was in the capacity of Avenger and Destroyer, that JOVE encountered and overthrew the *Titans* and *Giants*, whom TYPHON, BRIAREUS, TRITYUS, and the rest of their fraternity, led against the god of *Olympus*; to whom an eagle brought lightning and thunderbolts during the warfare: thus, in a similar contest between SIVA and the *Daityas*, or children

of

of DITI, who frequently rebelled against heaven, BRAHMA' is believed to have presented the god of destruction with *fiery shafts*. One of the many poems, entitled *Ramāyan*, the last book of which has been translated into *Italian*, contains an extraordinary dialogue between the crow *Blushunda*, and a rational Eagle, named GARUDA, who is often painted with the face of a beautiful youth, and the body of an imaginary bird; and one of the eighteen *Puranas* bears his name and comprizes his whole history. M. SONNERAT informs us, that VISHNU is represented in some places riding on the GARUDA, which he supposes to be the *Pondicheri* Eagle of BRISSEAU, especially as the *Brāhmins* of the Coast highly venerate that class of birds, and provide food for numbers of them at stated hours: I rather conceive the *Garuda* to be a fabulous bird, but agree with him, that the *Hindu* god, who rides on it, resembles the ancient JUPITER. In the old temples at *Gayā*, VISHNU is either mounted on this poetical bird or attended by it together with a little page; but, lest an etymologist should find GANES in GARUD, I must observe that the *Sanscrit* word is pronounced *Garuda*; though I admit, that the *Grecian* and *Indian* stories of the celestial bird and the page appear to have some resemblance. As the *Olympian* JUPITER fixed his court and held his councils on a lofty and brilliant mountain, so the appropriated seat of MAHA'DEVA, whom the *Sansa's* consider as the Chief of the Deities, was mount *Calosa*, every splinter of whose rocks was an incalculable gem: his terrestrial Faunts are the snowy hills of *Himalaya*, or that branch of them to the East of the *Brahmaputra*, which has the name of *Chandrasichara*, or the *Mountain of the Moon*. When, after all these circumstances, we learn that SIVA is believed to have *three* eyes, whence he is named also TRIROCHANA, and know from PAUSANIAS, not only that *Trophthalmus* was an epithet of ZEUS, but that a statue of him had been found, so early as the

the taking of *Troy*, with a *third eye* in his *forehead*, as we see him represented by the *Hindus*, we must conclude, that the identity of the two Gods full, here short of being demonstrated.

In the character of *Destroyer* also we may look upon this *Indian* Divinity as corresponding with the *Stygian* JovE, or PLUTO; especially since CA'LI' or *Time*, in the feminine gender, is a name of his consort, who will appear hereafter to be PROSERPINE: indeed, if we can rely on a *Persian* translation of the *Bhāgavat*, (for the original is not yet in my possession) the sovereign of *Pātāla*, or the *Infernal Regions*, is the *King of Serpents*, named SE'SHANA'GA; for CRISHNA is there said to have descended with his favourite ARJUN to the seat of that formidable divinity, from whom he instantly obtained the favour, which he requested, that the souls of a *Brahman's* six sons, who had been slain in battle, might reanimate their respective bodies; and SE'SHANA'GA is thus described: "He had a gorgeous appearance, with a thousand heads, and, on each of them, a crown set with resplendent gems, one of which was larger and brighter than the rest; his eyes gleamed like flaming torches; but his neck, his tongues, and his body were black; the skirts of his habiment were yellow, and a sparkling jewel hung in every one of his ears, his arms were extended, and adorned with rich bracelets, and his hands bore the holy shell, the radiated weapon, the mace for war, and the lotus." Thus PLUTO was often exhibited in painting and sculpture with a diadem and sceptre; but himself and his equipage were of the blackest shade.

There is yet another attribute of MAHABEES, by which he is visibly distinguished in the drawings and temples of *Benegal*. To destroy,



according to the *Védānti's* of *India*, the *Sij's* of *Persia*, and many philosophers of our *European* schools, is only to generate and reproduce in another form : hence the god of *Destruction* is holden in this country to preside over *Generation* ; as a symbol of which he rides on a *white bull*. Can we doubt, that the loves and feats of JUPITER GENITOR (not forgetting the *white bull* of EUROPA) and his extraordinary title of LAPIS, for which no satisfactory reason is commonly given, have a connexion with the *Indian* philosophy and mythology ? As to the deity of *Lampsacus*, he was originally a mere scare-crow, and ought not to have a place in any mythological system ; and, in regard to BACCHUS, the God of *Vintage*, (between whose acts and those of JUPITER we find, as BACON observes, a wonderful affinity) his *Ithyphallic* images, measures, and ceremonies alluded probably to the supposed relation of Love and Wine ; unless we believe them to have belonged originally to SIVA, one of whose names is *Vāgīs*, or BA'GĪ's, and to have been afterwards improperly applied. Though, in an essay on the gods of *India*, where the *Brahmans* are positively forbidden to taste fermented liquors, we can have little to do with BACCHUS, as God of Wine, who was probably no more than the imaginary president over the vintage in *Italy*, *Greece*, and the lower *Asia* ; yet we must not omit SURĀ'DĪ'VĪ', the Goddess of Wine, who arose, say the *Hindus*, from the ocean, when it was churned with the mountain *Mandar* : and this fable seems to indicate, that the *Indians* came from a country, in which wine was anciently made and considered as a blessing ; though the dangerous effects of intemperance induced their early legislators to prohibit the use of all spirituous liquors ; and it were much to be wished, that so wise a law had never been violated,

Here may be introduced the JUPITER *Marinus*, or NEPTUNE, of the  
*Romans*,





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वरुणपारसामहम् VARUNA



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सेनाजीनामहं संहः CARTICEYA

*Romans*, as resembling MAHA'DE'VA in his *generative* character; especially as the *Hindu* god is the husband of BHAVA'NI', whose relation to the *nature* is evidently marked by her image being restored to them at the conclusion of her great festival called *Durgotsava*: she is known also to have attributes exactly similar to those of VENUS *Marina*, whose birth from the sea-foam and splendid rise from the conch, in which she had been cradled, have afforded so many charming subjects to ancient and modern artists; and it is very remarkable, that the REMBHA' of INDRA'S court, who seems to correspond with the popular VENUS, or Goddess of Beauty, was produced, according to the *Indian* fabulists, from the froth of the churned ocean. The identity of the *trishula* and the *trident*, the weapon of SIVA and of NEPTUNE, seems to establish this analogy; and the veneration paid all over *India* to the large buccinum, especially when it can be found with the spiral line and mouth turned from left to right, brings instantly to our mind the musick of TRITON. The genius of water is VARUNA; but he, like the rest, is far inferior to MAHE'SA, and even to INDRA, who is the prince of the beneficent genii.

This way of considering the gods as individual substances, but as distinct persons in distinct characters, is common to the *European* and *Indian* systems; as well as the custom of giving the highest of them the greatest number of names: hence, not to repeat what has been said of JUPITER, came the triple capacity of DIANA; and hence her petition in CALLIMACHUS, that she might be *polyonymous* or *many-titled*. The consort of SIVA is more eminently marked by these distinctions than those of BRAHMA or VISHNU: she resembles the Isis *Myrionymos*, to whom an ancient marble, described by GRUTER, is dedicated; but her leading names and characters are PARVATI, DURGA', BHAVA'NI'.

As the *Mountain-born* Goddess, or PA'RVATI', she has many properties of the *Olympian* JUNO: her majestic deportment, high spirit, and general attributes are the same; and we find her both on Mount *Cailása*, and at the banquets of the deities, uniformly the companion of her husband. One circumstance in the parallel is extremely singular: she is usually attended by her son CA'RTICE'YA, who rides on a *peacock*; and, in some drawings, his own robe seems to be spangled with eyes; to which must be added that, in some of her temples, a *peacock*, without a rider, stands near her image. Though CA'RTICE'YA, with his six faces and numerous eyes, bears some resemblance to ARGUS, whom JUNO employed as her principal wardour, yet, as he is a deity of the second class, and the commander of celestial armies, he seems clearly to be the ORUS of *Egypt* and the MARS of *Italy*—his name SCANDA, by which he is celebrated in one of the *Puranas*, has a connexion, I am persuaded, with the old SECANDER of *Persia*, whom the poets ridiculously confound with the *Macedonian*.

The attributes of DURGA', or *Difficult of access*, are also conspicuous in the festival above-mentioned, which is called by her name, and in this character she resembles MINERVA, not the peaceful inventress of the fine and useful arts, but PALLAS, armed with a helmet and spear: both represent heroic *Valor*, or Valour united with Wisdom; both slew demons and giants with their own hands, and both protected the wife and virtuous, who paid them due adoration. As PALLAS, they say, takes her name from *carrying* a lance, and usually appears in complete armour, thus CARIS, the old *Latian* word for a spear, was one of JUNO's titles; and so, if GIRA'US be correct, was HOPLOSMIA, which at *Elys*, it seems, meant a female dressed in panoply, or complete accoutrements. The  
unarmed

*unarmed MINERVA* of the *Romans* apparently corresponds, as patroness of Science and Genius, with *SERESWATI*, the wife of *BRAHMA*, and the emblem of his principal *Creative Power*: both goddesses have given their names to celebrated grammatical works; but the *Sareswata* of *SARUP CHAKRYA* is far more concise as well as more useful and agreeable than the *Minor* of *SANCTIUS*. The *MINERVA* of *Italy* invented the *flute*, and *SERESWATI* presides over melody: the protectress of *Athens* was even, on the same account, surnamed *MUSIC*.

Many learned mythologists, with *GERALDUS* at their head, consider the peaceful *MINERVA* as the *ISIS* of *Egypt*; from whose temple at *Sais* a wonderful inscription is quoted by *PLOTINUS*, which has a resemblance to the four *Sanskrit* verses above exhibited as the text of the *Isis*. “ I am all, that hath been, and is, and shall be; and my veil no mortal hath ever removed.” For my part I have no doubt, that the *ISIS* of *India* and *ISIS* of the *Hindus* are the *Osiris* and *Isis* of the *Egyptians*; though a distinct essay in the manner of *PLOTINUS* would be requisite in order to demonstrate their identity: they mean, I conceive, the *Power of Nature* considered as Male and Female; and *ISIS*, like the other goddess, represents the active power of her lord, whose *egrotiforme* under which he becomes visible to man, were thus enumerated by *CALANUS* near two thousand years ago. “ *Water* was the first work of the Creator; and “ *Fire* receives the oblation of clarified butter, as the law ordaineth. “ *Sacrifice* is performed with solemnity, the *two Lights* of heaven illumine “ *guish* time; the subtil *Ether*, which is the vehicle or sound pervades the “ *universe*; the *Earth* is the natural parent of all metals; and by the “ *things* breathing are animated. may *ISIS*, the *parent* propitiably “ *parent* in these eight forms, bless and sustain you! The *gods* and “ *gods* for ever.”

therefore, as well as the Sun and Moon, are considered as *ī'sa* or the *Ruler*, from which word *ī'sī'* may be regularly formed, though *ī'sa'ni'* be the usual name of his *active Power*, adored as the Goddess of Nature. I have not yet found in *Sanscrit* the wild, though poetical, tale of *Io*; but am persuaded, that, by means of the *Purānas*, we shall in time discover all the learning of the *Egyptians* without decyphering their hieroglyphicks: the bull of *Isis* seems to be *Apis*, or *Ap*, as he is more correctly named in the true reading of a passage in *JEREMIAH*; and, if the veneration shown both in *Tibet* and *India* to so amiable and useful a quadruped as the cow, together with the regeneration of the *LAMA* himself, have not some affinity with the religion of *Egypt* and the idolatry of *Israel*, we must at least allow that circumstances have wonderfully coincided. *BIHAVA'NI'* now demands our attention; and in this character I suppose the wife of *MAHA'DI'VA* to be as well the *JUNO Cinna* or *LUCINA* of the *Romans* (called also by them *DIANA Solitrona*, and by the *Greeks* *ILITHYIA*) as *VENUS* herself; not the *Idalian* queen of laughter and jollity, who with her nymphs and graces, was the beautiful child of poetical imagination, and answers to the *Indian RIMBHA'* with her celestial train of *Apsaras*, or damsels of paradise; but *VENUS Urania*, so luxuriantly painted by *LUCIFERUS*, and so properly invoked by him at the opening of a poem on nature, *VENUS*, presiding over *generation*, and, on that account, exhibited sometimes of both sexes, (an union very common in the *Indian* sculptures) as in her bearded statue at *Rome*, in the images perhaps called *Hermathena*, and in those figures of her, which had the form of a comical *marionette*. "for the reason of which figure we are left, says *TACITUS*, in the dark." the reason appears too clearly in the temples and paintings of *Hindustan*: where it never seems to have entered the heads of the legislators or people that any thing natural could be offensively







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भजनशास्त्रिकंदर्पः C.A.M.A.



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सोतसामस्त्रिकंदर्पः ३१ C.A.M.A.

sively obscene; a singularity which pervades all their writings and conversation, but is no proof of depravity in their morals. Both PIARO and CICERO speak of EROS, or the Heavenly CUPID, as the son of VENERUS and JUPITER; which proves, that the monarch of *Olympus* and the Goddess of Fecundity were connected as MAHA'DE'VA and BHAVANI: the God CA'MA, indeed, had MA'YA' and CANYAPA, or *Uranus*, for his parents, at least according to the mythologists of *Cashmir*; but, in most respects, he seems the twin-brother of CUPID with richer and more lively appendages. One of his many epithets is *Dipaca*, the *Inflamer*, which is erroneously written *Dipuc*; and I am now convinced, that the sort of resemblance, which has been observed between his *Latin* and *Sanscrit* names, is accidental: in each name the three first letters are the root, and between them there is no affinity. Whether any mythological connexion subsisted between the *amaracus*, with the fragrant leaves of which Hymen bound his temples, and the *tulasi* of *India*, must be left undetermined: the botanical relation of the two plants (if *amaracus* be properly translated *myrroram*) is extremely near.

One of the most remarkable ceremonies, in the festival of the *Indian* Goddesses, is that before-mentioned of casting her image into the river: the *Pandits*, of whom I inquired concerning its origin and import, answered, "that it was prescribed by the *Vêda*, they knew not why. But this custom has, I conceive, a relation to the doctrine, that *water* is a *form* of I'SVARA, and consequently of I'SA'NI' who is even represented by some as the patroness of that element, to which her figure is restored, after having received all due honours on *earth*, which is considered as another *form* of the God of Nature, though subsequent, in the order of Creation, to the primeval fluid. There seems no decisive proof of a

original system among idolatrous nations in the worship of river-gods and river-goddesses, nor in the homage paid to their streams, and the ideas of purification annexed to them: since *Greeks, Italians, Egyptians,* and *Hindus* might (without any communication with each other) have adored the several divinities of their great rivers, from which they derived pleasure, health, and abundance. The notion of Doctor MUSGRAVE, that large rivers were supposed, from their strength and rapidity, to be conducted by Gods, while rivulets only were protected by female deities, is, like most other notions of grammarians on the genders of nouns, overthrown by facts. Most of the great *Indian* rivers are feminine; and the three goddesses of the waters, whom the *Hindus* chiefly venerate, are GANGA', who sprang, like armed PALLAS, from the head of the *Indian* Jove; YAMUNA, daughter of the Sun, and SERESWATH: all three meet at *Prayaga*, thence called *Triveni*, or *the three plaited locks*; but SERESWATH, according to the popular belief, sinks under ground, and rises at another *Triveni* near *Hugh*, where she rejoins her beloved GANGA'. The *Brahmaputra* is, indeed, a male river; and, as his name signifies the Son of BRAHMA', I thence took occasion to feign that he was married to GANGA', though I have not yet seen any mention of him, as a God, in the *Sanscrit* books.

TWO incarnate deities of the first rank, RA'MA and CRISHNA, must now be introduced, and their several attributes distinctly explained. The first of them, I believe, was the DIONYSOS of the *Greeks*, whom they named BROMIUS, without knowing why, and BUCENES, when they represented him *horned*, as well as LYAIOS and ELEUTHERIOS, the Deliverer, and TRAMBOS or DITHYRAMBOS, the Triumphant: most of those titles were adopted by the *Romans*, by whom he was called BRUMA, TAURI-

FORMIS,

**FORMIS, LIBER, TRIUMPHUS;** and both nations had records or traditory accounts of his *giving laws* to men and deciding their contests, of his improving navigation and commerce, and, what may appear yet more observable, of his conquering *India* and other countries with an army of *Satyrs*, commanded by no less a personage than **PAN**; whom **LITUS CECILIALDUS**, on what authority I know not, asserts to have resided in *India*, “when he had returned, says the learned mythologist, from the *Indians* war, in which he accompanied **BACCHUS**.” It were superfluous in a mere essay, to run any length in the parallel between this *European* God and the sovereign of *Ayodhya*, whom the *Hindus* believe to have been an appearance on earth of the *Preserving Power*; to have been a Conqueror of the highest renown, and the Deliverer of nations from tyrants, as well as of his consort **SIRRA** from the giant **RAVAN**, king of *Lavana*, and to have commanded in chief a numerous and intrepid race of those large *Monkeys*, which our naturalists, or some of them, have denominated *Indian Satyrs*: his General, the Prince of *Satyrs*, was named **HANUMAN**, or *with high cheek-bones*; and, with workmen of such agility, he soon raised a bridge of rocks over the sea, part of which, say the *Hindus*, yet remains; and it is, probably, the series of rocks, to which the *Moors* or the *Portuguese* have given the foolish name of **ADAM’S** (it should be called **RAVAN’S**) bridge. Might not this army of *Satyrs* have been only a race of mountaineers, whom **RAVAN**, if such a monarch ever existed, had conquered? However that may be, the large breed of *Indian Apes* is at the present held in high veneration by the *Hindus*, and fed with devotion by the *Bráhmans*, who seem, in two or three places on the banks of the *Ganges*, to have a regular endowment for the support of them. These animals, of three or four hundred, are wonderfully gentle, (I speak of such as are tame) and appear to have some kind of order and discipline.

little sylvan polity. We must not omit, that the father of *Hanumat* was the God of Wind, named PAVAN, one of the eight Genii; and, as PAN improved the pipe by adding six reeds, and “played exquisitely on the” cithern a few moments after his birth,” so one of the four systems of *Indian* musick bears the name of HANUMAT, or HANUMA’N in the nominative, as its inventor, and is now in general estimation.

The war of *Lancá* is dramatically represented at the festival of RA’MA on the ninth day of the new moon of *Chaitra*; and the drama concludes (says HOFWIL, who had often seen it) with an exhibition of the fire-ordeal, by which the victor’s wife SI’TA’ gave proof of her connubial fidelity: “the dialogue, he adds, is taken from one of the Eighteen holy books.” meaning, I suppose, the *Puranas*; but the *Hindus* have a great number of regular dramas at least two thousand years old, and among them are several very fine ones on the story of RA’MA. The first poet of the *Hindus* was the great VA’LMÍ’K, and his *Rámáyan* is an Epick Poem on the same subject, which, in unity of action, magnificence of imagery, and elegance of style, far surpasses the learned and elaborate work of NONNUS, entitled *Dionysiaca*, half of which, or twenty-four books, I perused with great eagerness, when I was very young, and should have travelled to the conclusion of it, if other pursuits had not engaged me: I shall never have leisure to compare the *Dionysiacs* with the *Rámáyan*, but am confident, that an accurate comparison of the two poems would prove DIONYSOS and RA’MA to have been the same person; and I incline to think, that he was RA’MA, the son of CU’S’H, who might have established the first regular government in this part of *Asia*. I had almost forgotten, that *Meros* is said by the *Greeks* to have been a mountain of *India*, on which their DIONYSOS was born, and that *Mérn*, though it generally means the north pole in the *Indian* geography, is also a mountain near the city of *Naishada* or *Nysa*, call-

ed by the Grecian geographers *Dionysopolis*, and universally celebrated in the Sanscrit poems; though the birth-place of RÁMA is supposed to have been *Ajódhyá* or *Audh*. That ancient city extended, if we believe the *Bráhmans*, over a line of ten *Yojans*, or about forty miles, and the present city of *Lac'hnaú*, pronounced *Lucnow*, was only a lodge for one of its gates, called *Lacshmanadwára*, or the gate of *Lacshmana*, a brother of RÁMA: M. SONNERAT supposes *Ajodhya* to have been *Siam*; a most erroneous and unfounded supposition! which would have been of little consequence, if he had not grounded an argument on it, that RÁMA was the same person with *Buddha*, who must have appeared many centuries after the conquest of *Lancá*.

The second great divinity, *CRISHNA*, passed a life, according to the *Hindians*, of a most extraordinary and incomprehensible nature. He was the son of *DE'VACI'* by *VASUD'EVÁ*; but his birth was concealed through fear of the tyrant *CANSA*, to whom it had been predicted, that a child born at that time in that family would destroy him: he was fostered, therefore, in *Mathurá*, by an honest herdsman, surnamed *ANANDA*, or *Happy*, and his amiable wife *YASODÁ'*, who, like another *PAME*, was constantly occupied in her pastures and her dairy. In their family were a multitude of young *Gopa's*, or *Cowherds*, and beautiful *Gopi's*, or *milkmaids*, who were his play-fellows during his infancy; and, in his early youth, he selected *nine* damsels as his favourites, with whom he passed his gay hours in dancing, sports, and playing on his flute. For the remarkable number of his *Gopi's* I have no authority but a whimsical picture, where *nine* girls are grouped in the form of an elephant, on which he sits and pipes; and, unfortunately, the word *nava* signifies both *nine* and *new*, or young; so that, in the following stanza, it may admit of two interpretations:





Vol. I P 260 रामः च तथुलामहम् RAMA.



Vol. I P 259 दशनामछदेगोप्ति GRISHNA

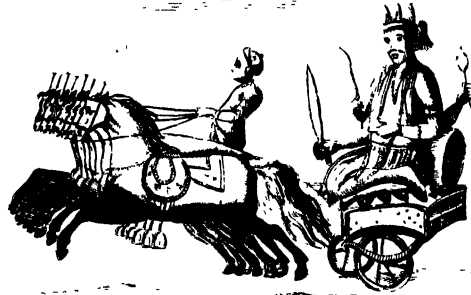




thrown over one shoulder, and folded, like ribands, across the breast; with bracelets too on one arm, and on each wrist: they are naked to the waists, and uniformly with *dark azure* flesh, in allusion, probably to the tint of that primordial fluid, on which NA'RA'YAN moved in the beginning of time; but their skirts are bright yellow, the colour of the curious pericarpium in the centre of the water-lily, where *Nature*, as Dr. MURRAY observes, *in some degree discloses her secrets*, each seed containing, before it germinates, a few perfect leaves: they are sometimes drawn with that flower in one hand; a radiated elliptical ring, used as a missile weapon, in a second; the sacred shell, or left-handed buccinum, in a third; and a mace or battle-ax, in a fourth; but CRISHNA, when he appears, as he sometimes does appear, among the *Atatárs*, is more splendidly decorated than any, and wears a rich garland of sylvan flowers, whence he is named VANAMA'LI, as low as his ankles, which are adorned with strings of pearls. Dark blue, approaching to *black*, which is the meaning of the word *Crishna*, is believed to have been his complexion; and hence the large bee of that colour is consecrated to him, and is often drawn fluttering over his head: that azure tint, which approaches to blackness, is peculiar, as we have already remarked, to VISHNU; and hence, in the great reservoir or cistern at *Catmandu*, the capital of *Nepal*, there is placed in a recumbent posture a large well-proportioned image of *blue* marble, representing NA'RA'YAN floating on the waters. But let us return to the actions of CRISHNA; who was not less heroick, than lovely, and, when a boy, slew the terrible serpent *Caluya* with a number of giants and monsters. at a more advanced age, he put to death his cruel enemy CANSU; and, having taken under his protection the king YUDHISHT'HIR and the other *Pandus*, who had been grievously oppressed by the *Curus*, and their tyrannical chief, he kindled the war defended in  
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the great epick poem, entitled the *Mahábhárat*, at the prosperous conclusion of which he returned to his heavenly seat in *Vaicont'ha*, having left the instructions comprized in the *Gîtá* with his disconsolate friend ARJUN, whose grandson became sovereign of *India*.

In this picture it is impossible not to discover, at the first glance, the features of APOLLO, surnamed *Nomios*, or the *Pastoral*, in *Greece*, and OPIFER in *Italy*; who fed the herds of ADMETUS, and slew the serpent *Python*; a god, amorous, beautiful, and warlike: the word *Góvinda* may be literally translated *Nomios*, as *Césava* is *Crinitus*, or *with fine hair*; but whether *Gópála*, or the *herdsman*, has any relation to *Apollo*, let our etymologists determine. COLONEL VALLENCEY, whose learned inquiries into the ancient literature of *Ireland* are highly interesting, assures me, that *Crishna* in *Irish* means the SUN; and we find APOLLO and SOL considered by the *Roman* poets as the same deity: I am inclined, indeed, to believe, that not only CRISHNA or VISHNU, but even BRAHMA' and SIVA, when united, and expressed by the mystical word O'M, were designed by the first idolaters to represent the solar fire; but PHOLBUS, or the orb of the Sun personified, is adored by the *Indians* as the God SU'RYA, whence the sect, who pay him particular adoration, are called *Saurus*: their poets and painters describe his car as drawn by seven green horses, preceded by ARUN, or the *Dawn*, who acts as his charioteer, and followed by thousands of genii worshipping him and modulating his praises. He has a multitude of names, and among them twelve epithets or titles, which denote his distinct powers in each of the twelve months: those powers are called *Adityas*; or sons of ADITI by CASYAPA, the *Indian* URANUS; and one of them has, according to some authorities, the name of VISHNU or *Pervader*. SU'RYA is believed to have descended frequently  
from



Vol. I  
P. 262 ज्योतिषांरविंशमात्र SURYA



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P. 264 देवधीक्षणाचारः । NAREDA



from his car in a human shape, and to have left a race on earth, who are equally renowned in the *Indian* stories with the *Heliada* of *Greece*. It is very singular, that his two sons, called ASWINAU, or ASWINICUMAT, in the dual, should be considered as twin-brothers, and painted like CASTOR and POLLUX; but they have each the character of ÆSCULAPUS among the gods, and are believed to have been born of a nymph, who, in the form of a mare, was impregnated with sun-beams. I suspect the whole fable of CASYAPA and his progeny to be astronomical; and cannot but imagine, that the *Greek* name CASSIOPIA has a relation to it. Another great *Indian* family are called the *Children of the Moon*, or CHANDRA; who is a male deity, and consequently not to be compared with ARTEMIS or DIANA; nor have I yet found a parallel in *India* for the goddess of the *Chase*, who seems to have been the daughter of an *European* fancy, and very naturally created by the invention of *Bucolick* and *Georgick* poets: yet, since the *Moon* is a form of ISWARA, the God of Nature, according to the verse of CA'LIDASA, and since ISAN has been shown to be his consort or power, we may consider her, in one of her characters, as LUNA; especially as we shall soon be convinced that, in the shades below, she corresponds with the HECAIE of *Europe*.

The worship of Solar, or Veshal, *Fire* may be ascribed, like that of OMNIS and ISIS, to the second source of mythology, or an enthusiastic admiration of Nature's wonderful powers; and it seems, as far as I can yet understand the *Vedas*, to be the principal worship recommended in them. We have seen, that MAHA'DEVA himself is personated by *Fire*, but subordinate to him is the God AGNI, often called PAVACA, or the *Purifier*, who answers to the VULCAN of *Egypt*, where he was a deity of high rank; and his wife SWAHNA resembles the younger VESTA, or VESTIA.

as the *Eolians* pronounced the *Greek* word for a *hearth*. BHAVA'NI, or VENUS, is the consort of the Supreme Destructive and Generative Power; but the *Greeks* and *Romans*, whose system is less regular than that of the *Indians*, married her to their *divine artist*, whom they also named HEPHAISTOS and VULCAN, and who seems to be the *Indian* VISWACARMAN, the *forger of arms* for the Gods, and inventor of the *agnyastra*, or *fiery shaft*, in the war between them and the *Daityas* or *Titans*. It is not easy here to refrain from observing (and, if the observation give offence in *England*, it is contrary to my intention) that the newly discovered planet should unquestionably be named VULCAN; since the confusion of analogy in the names of the planets is inelegant, unscholarly, and unphilosophical: the name URANUS is appropriated to the firmament; but VULCAN, the slowest of the Gods, and, according to the *Egyptian* priests, the oldest of them, agrees admirably with an orb, which must perform its revolution in a very long period; and, by giving it this denomination, we shall have seven primary planets with the names of as many *Roman* Deities, MERCURY, VENUS, TELLUS, MARS, JUPITER, SATURN, VULCAN.

It has already been intimated, that the MUSES and NYMPHS are the GOPIA of *Mathurá*, and of *Góverdhan*, the *Parnassus* of the *Hindus*; and the lyric poems of JAYADIVA will fully justify this opinion; but the *Nymphs* of *Musick* are the thirty RA'GINI'S, or *Female Passions*, whose various functions and properties are so richly delineated by the *Indian* painters and so finely described by the poets; but I will not anticipate what will require a separate Essay, by enlarging here on the beautiful allegories of the *Hindus* in their system of musical modes, which they call RA'GA'S, or *Passions*, and suppose to be Genii or Demigods. A very distinguished son of BRAHMA', named NA'RE'D, whose actions are the subject of a

*Purána*,

*Purána*, bears a strong resemblance to HERMES or MERCURY: he was a wise legislator, great in arts and in arms, an eloquent messenger of the Gods either to one another or to favoured mortals, and a musician of exquisite skill. His invention of the *Viná*, or *Indian* lute, is thus described in the poem entitled *Mágha*: "NA'RED sat watching from time to time his " large *Viná*, which, by the impulse of the breeze, yielded notes, that " pierced successively the regions of his ear, and proceeded by musical intervals." The law tract, supposed to have been revealed by NA'RED, is at this hour cited by the *Pandits*; and we cannot therefore, believe him to have been the patron of *Thieves*; though an innocent theft of CRISHNA's cattle, by way of putting his divinity to a proof, be strangely imputed, in the *Bhágavat*, to his father BRAHMA'.

The last of the *Greek* or *Italian* divinities, for whom we find a parallel in the Pantheon of *India*, is the *Stygian* or *Taurick* DIANA, otherwise named HECATE, and often confounded with PROSERPINE; and there can be no doubt of her identity with CA'LI', or the wife of SIVA in his character of the *Stygian* Jove. To this black goddess with a collar of golden skulls, as we see her exhibited in all her principal temples, *human sacrifices* were anciently offered, as the *Védas* enjoined; but, in the present age, they are absolutely prohibited, as are also the sacrifices of bulls and horses. Kids are still offered to her; and, to palliate the cruelty of the slaughter, which gave such offence to BUDDHA, the *Bráhmans* inculcate a belief, that the poor victims rise in the heaven of INDRA, where they become the musicians of his band. Instead of the obsolete, and now illegal, sacrifices of a man, a bull, and a horse, called *Neramédha*, *Gómédha*, and *Áswamédha*, the powers of nature are thought to be propitiated by the



less bloody ceremonies at the end of autumn, when the festivals of CA'LI' and LACSHMI' are solemnized nearly at the same time. Now, if it be asked, how the Goddess of Death came to be united with the mild patroness of Abundance, I must propose another question, "How came PROSERPINE "to be represented in the *European* system as the daughter of CERES?" Perhaps, both questions may be answered by the proposition of natural philosophers, that "the apparent destruction of a substance is the production of it in a different form." The wild musick of CA'LI's priests at one of her festivals brought instantly to my recollection the *Scythian* measures of DIANA's adorers in the splendid opera of IPHIGENIA in *Tauris*, which GLUCK exhibited at *Paris* with less genius, indeed, than art, but with every advantage that an orchestra could supply.

That we may not dismiss this assemblage of *European* and *Asiatick* divinities with a subject so horrid as the altars of HECATE and CA'LI', let us conclude with two remarks, which properly, indeed, belong to the *Indian* Philosophy, with which we are not at present concerned. First; *Elysium* (not the place, but the bliss enjoyed there, in which sense MILTON uses the word) cannot but appear, as described by the poets, a very tedious and insipid kind of enjoyment: it is, however, more exalted than the temporary *Elysium* in the court of INDRA, where the pleasures, as in MUHAMMED's paradise, are wholly sensual; but the *Mukti*, or *Elysian* happiness of the *Védánta* School is far more sublime; for they represent it as a total absorption, though not such as to destroy consciousness, in the divine essence; but, for the reason before suggested, I say no more of this idea of beatitude, and forbear touching on the doctrine of transfiguration and the similarity of the *Védánta* to the *Sicilian*, *Italick*, and old *Academick* Schools.

Secondly;

Secondly; in the mystical and elevated character of PAN, as a personification of the *Universe*, according to the notion of LORD BACON, there arises a sort of similitude between him and CRISHNA considered as NA'RA'YAN. The *Grecian* God plays divinely on his reed, to express, we are told, ethereal harmony; he has his attendant Nymphs of the pastures and the dairy; his face is as radiant as the sky, and his head illumined with the horns of a crescent; whilst his lower extremities are deformed and shaggy, as a symbol of the vegetables which the earth produces, and of the beasts who roam over the face of it. Now we may compare this portrait partly with the general character of CRISHNA, the Shepherd God, and partly with the description in the *Bhāgavat* of the Divine Spirit exhibited in the form of this *Universal World*; to which we may add the following story from the same extraordinary poem. The Nymphs had complained to YASO'DA', that the child CRISHNA had been drinking their curds and milk: on being reprov'd by his foster-mother for this indiscretion, he requested her to examine his mouth; in which, to her just amazement, she beheld the *whole universe* in all its plenitude of magnificence.

We must not be surprized at finding, on a close examination, that the characters of all the Pagan Deities, male and female, melt into each other, and at last into one or two; for it seems a well-founded opinion, that the whole crowd of gods and goddesses in ancient *Rome*, and modern *Vārānes*, mean only the powers of nature, and principally those of the SUN, expressed in a variety of ways and by a multitude of fanciful names.

Thus have I attempted to trace, imperfectly at present, for want of ampler materials, but with a confidence continually increasing as I advanced, a parallel between the Gods adored in three very different nations,

*Greece, Italy, and India*: but, which was the original system, and which the copy, I will not presume to decide; nor are we likely, I believe, to be soon furnished with sufficient grounds for a decision. The fundamental rule, that *natural, and most human, operations proceed from the simple to the compound*, will afford no assistance on this point; since neither the *Asiatick* nor *European* system has any simplicity in it; and both are so complex, not to say absurd, however intermixed with the beautiful and the sublime, that the honour, such as it is, of the invention cannot be allotted to either with tolerable certainty.

Since *Egypt* appears to have been the grand source of knowledge for the *western*, and *India* for the more *eastern*, parts of the globe, it may seem a material question, whether the *Egyptians* communicated their mythology and philosophy to the *Hindus*, or conversely; but what the learned of *Memphis* wrote or said concerning *India*, no mortal knows; and what the learned of *Várânes* have asserted, if any thing, concerning *Egypt*, can give us little satisfaction: such circumstantial evidence on this question as I have been able to collect, shall nevertheless be stated; because, unsatisfactory as it is, there may be something in it not wholly unworthy of notice; though after all, whatever colonies may have come from the *Nile* to the *Ganges*, we shall, perhaps, agree at last with Mr. BRYANT, that *Egyptians, Indians, Greeks, and Italians*, proceeded originally from one central place, and that the same people carried their religion and sciences into *China* and *Japan*: may we not add, even to *Mexico* and *Peru*?

Every one knows that the true name of *Egypt* is *Misr*, spelled with a palatal sibilant both in *Hebrew* and *Arabick*. It seems in *Hebrew* to have

have been the proper name of the first settler in it; and, when the *Arabs* use the word for a great city, they probably mean a city like the capital of *Egypt*. Father MARCO, a *Roman* missionary, who, though not a scholar of the first rate, is incapable, I am persuaded, of deliberate falsehood, lent me the last book of a *Rámáyan*, which he had translated through the *Hindi* into his native language, and with it a short vocabulary of mythological and historical names, which had been explained to him by the *Pandits* of *Betiya*, where he had long resided. One of the articles in his little dictionary was, “*Tirút*, a town and province, in which the “priests from *Egypt* settled;” and when I asked him what name *Egypt* bore among the *Hindus*, he said *Misr*, but observed, that they sometimes confounded it with *Abyssinia*. I perceived that his memory of what he had written was correct; for *Misr* was another word in his index, “from “which country (he said) came the *Egyptian* priests, who settled in *Tirút*.” I suspected immediately that his intelligence flowed from the *Muselmans*, who call sugar-candy *Misri*, or *Egyptian*; but when I examined him closely, and earnestly desired him to recollect from whom he had received his information, he repeatedly and positively declared, that “it had “been given him by several *Hindus*, and particularly by a *Bráhma*n, his “intimate friend, who was reputed a considerable *Pandit*, and had lived “three years near his house.” We then conceived that the seat of his *Egyptian* colony must have been *Tiróhit*, commonly pronounced *Tirut*, and anciently called *Mit'hilá*, the principal town of *Janacadeśa*, or north *Behár*; but MAHE'SA *Pandit*, who was born in that very district, and who submitted patiently to a long examination concerning *Misr*, overset all our conclusions: he denied that the *Bráhma*ns of his country were generally surnamed *Misr*, as we had been informed; and said, that the addition of *MISRA* to the name of VA'CHESPETI, and other learned  
author

authors, was a title formerly conferred on the writers of *miscellanies*, or *compilers* of various tracts on religion or science, the word being derived from a root signifying to *mix*. Being asked, where the country of *Misr* was, “ There are two (he answered) of that name: one of them *in the west*, under the dominion of *Muselmáns*; and another, which all the “ *Sástras* and *Puranas* mention, in a mountainous region to the north “ of *Ayódhya*.” It is evident that by the first he meant *Egypt*; but what he meant by the second it is not easy to ascertain. A country called *Tiruhut* by our geographers, appears in the maps between the north-eastern frontier of *Audh* and the mountains of *Népal*: but whether that was the *Tirút* mentioned to father MARCO by his friend of *Betiya*, I cannot decide. This only I know with certainty, that *Misra* is an epithet of two *Brahmans* in the drama of *SACONTALA*, which was written near a century before the birth of CHRIST; that some of the greatest lawyers, and two of the finest dramatick poets, of *India* have the same title; that we hear it frequently in court added to the names of *Hindu* parties; and that none of the *Pandits*, whom I have since consulted, pretend to know the true meaning of the word, as a proper name, or to give any other explanation of it than that it is a *surname* of *Bráhmans in the west*. On the account given to Colonel KYN by the old *Rájá* of *Crishnanagar*, “ concerning traditions “ among the *Hindus*, that some *Egyptians* had settled in this country,” I cannot rely; because I am credibly informed by some of the *Rájá*’s own family, that he was not a man of solid learning, though he possessed curious books, and had been attentive to the conversation of learned men: besides, I know that his son, and most of his kinsmen, have been dabblers in *Persian* literature, and believe them very likely, by confounding one source of information with another, to puzzle themselves, and mislead those, with whom they converse. The word *Misr*, spelled also in *Sanscrit* with a palatal

palatial sibilant, is very remarkable; and, as far as etymology can help us, we may safely derive *Nilus* from the *Sanscrit* word *nīla*, or *blue*; since DIONYSIUS expressly calls the waters of that river “an azure stream;” and if we can depend on MARCO’s *Italian* version of the *Rāmāyan*, the name of *Nila* is given to a lofty and sacred mountain with a summit of pure gold, from which flowed a river of clear, sweet, and fresh water. M. SONNERAT refers to a dissertation by Mr. SCHMIT, which gained a prize at the Academy of Inscriptions, “On an *Egyptian* colony established in “*India* :” it would be worth while to examine his authorities, and either to overturn or verify them by such higher authorities as are now accessible in these provinces. I strongly incline to think him right, and to believe that *Egyptian* priests have actually come from the *Nile* to the *Gangā* and *Yamunā*, which the *Brāhmans* most assuredly would never have left. They might, indeed, have come either to be instructed or to instruct; but it seems more probable that they visited the *Sarmans* of *India*, as the sages of *Greece* visited them, rather to acquire than to impart knowledge; nor is it likely that the self-sufficient *Brāhmans* would have received them as their preceptors.

Be all this as it may, I am persuaded that a connexion subsisted between the old idolatrous nations of *Egypt*, *India*, *Greece*, and *Italy*, long before they migrated to their several settlements, and consequently before the birth of *MOSIS*; but the proof of this proposition will in no degree affect the truth and sanctity of the *Mosaic* history, which, if confirmation were necessary, it would rather tend to confirm. The *Du me Legate*, educated by the daughter of a king, and in all respects highly accomplished, could not but know the mythological system of *Egypt*; but he must have condemned the superstitions of that people, and despised the speculative abstru-

dities

dities of their priests; though some of their traditions concerning the creation and the flood were grounded on truth. Who was better acquainted with the mythology of *Athens* than SOCRATES? Who more accurately versed in the Rabbinical doctrines than PAUL? Who possessed clearer ideas of all ancient astronomical systems than NEWTON, or of scholastick metaphysics than LOCKE? In whom could the *Romish* church have had a more formidable opponent than in CHILLINGWORTH, whose deep knowledge of its tenets rendered him so competent to dispute them? In a word, who more exactly knew the abominable rites and shocking idolatry of *Canaan* than MOSES himself? Yet the learning of those great men only incited them to seek other sources of truth, piety, and virtue, than those in which they had long been immerfed. There is no shadow then of a foundation for an opinion, that MOSES borrowed the first nine or ten chapters of *Genesis* from the literature of *Egypt*: still less can the adamantine pillars of our *Christian* faith be moved by the result of any debates on the comparative antiquity of the *Hindus* and *Egyptians*, or of any inquiries into the *Indian* theology. Very respectable natives have assured me, that one or two missionaries have been absurd enough, in their zeal for the conversion of the *Gentiles*, to urge, “ that the *Hindus* were even “ now almost *Christians*, because their BRAHMA', VISHNU, and MAHE'- “ SA, were no other than the *Christian* trinity;” a sentence in which we can only doubt, whether folly, ignorance, or impiety predominates. The three powers, creative, preservative, and destructive, which the *Hindus* express by the trilateral word *O'm*, were grossly ascribed by the first idolaters to the heat, light, and flame of their mistaken divinity, the Sun; and their wiser successors in the east, who perceived that the sun was only a created thing, applied those powers to its Creator; but the *Indian* triad, and that of PLATO, which he calls the Supreme Good, the Reason, and the Soul, are

are infinitely removed from the holiness and sublimity of the doctrine which pious *Christians* have deduced from texts in the Gospel, though other *Christians*, as pious, openly profess their dissent from them. Each sect must be justified by its own faith and good intentions. This only I mean to inculcate, that the tenet of our church cannot, without profaneness, be compared with that of the *Hindus*, which has only an apparent resemblance to it, but a very different meaning. One singular fact, however, must not be suffered to pass unnoticed. That the name of CRISHNA, and the general outline of his story, were long anterior to the birth of our Saviour, and probably to the time of HOMER, we know very certainly; yet the celebrated poem, entitled *Bhāgavat*, which contains a prolix account of his life, is filled with narratives of a most extraordinary kind, but strangely variegated and intermixed with poetical decorations. The incarnate deity of the *Sanscrit* romance was cradled, as it informs us, among *herdsmen*; but it adds, that he was educated among them, and passed his youth in playing with a party of milkmaids; a tyrant, at the time of his birth, ordered all new-born males to be slain, yet this wonderful babe was preserved by biting the breast, instead of sucking the poisoned nipple, of a nurse commissioned to kill him. He performed amazing, but ridiculous, miracles in his infancy, and, at the age of seven years, held up a mountain on the tip of his little finger. He saved multitudes, partly by his arms, and partly by his miraculous powers. He raised the dead, by descending for that purpose to the lowest regions. He was the meekest and best-tempered of beings, washed the feet of the *Brāhmans*, and preached very nobly, indeed, and sublimely, but always in their favour. He was pure and chaste in reality, but exhibited an appearance of excessive libertinism, and had wives or mistresses too numerous to be counted; lastly, he was benevolent and tender, yet fomented and conducted a terrible war. This motley story must induce an opinion, that



the spurious Gospels, which abounded in the first age of *Christianity*, had been brought to *India*, and the wildest parts of them repeated to the *Hindus*, who ingrafted them on the old fable of CÆSARA, the APOLLO of *Greece*.

As to the general extension of our pure faith in *Hindustán*, there are at present many sad obstacles to it. The *Muselmáns* are already a sort of heterodox *Christians*. They are *Christians*, if LOCKE reasons justly, because they firmly believe the immaculate conception, divine character, and miracles of the MESSIAH; but they are heterodox, in denying vehemently his character of Son, and his equality, as God, with the Father, of whose unity and attributes they entertain and express the most awful ideas; while they consider our doctrine as perfect blasphemy, and insist, that our copies of the Scriptures have been corrupted both by *Jews* and *Christians*. It will be inexpressibly difficult to undeceive them, and scarce possible to diminish their veneration for MOHAMMED and ALI, who were both very extraordinary men, and the second a man of unexceptionable morals: the *Korán* shines, indeed, with a borrowed light, since most of its beauties are taken from our Scriptures; but it has great beauties, and the *Muselmáns* will not be convinced that they were borrowed. The *Hindus*, on the other hand, would readily admit the truth of the Gospel; but they contend, that it is perfectly consistent with their *Sústras*. The deity, they say, has appeared innumerable times, in many parts of this world and of all worlds, for the salvation of his creatures; and though we adore him in one appearance, and they in others, yet we adore, they say, the same God, to whom our several worships, though different in form, are equally acceptable, if they be sincere in substance. We may assure ourselves, that neither *Muselmans* nor *Hindus* will ever be converted by any mission from  
the

the church of *Rome*, or from any other church; and the only human mode, perhaps, of causing so great a revolution, will be to translate into *Sanscrit* and *Persian* such chapters of the Prophets, particularly of *ISAIAH*, as are indisputably evangelical, together with one of the gospels, and a plain plectatory discourse, containing full evidence of the very distant ages, in which the predictions themselves, and the history of the Divine Person predicted, were severally made publick; and then quietly to disperse the work among the well-educated natives; with whom, if, in due time, it failed of producing very salutary fruit by its natural influence, we could only lament more than ever the strength of prejudice and the weakness of unassisted reason.

## X.

## A DESCRIPTION OF A CAVE NEAR GYA'.

BY JOHN HERBERT HARRINGTON, Esq.

A KNOWLEDGE of the Antiquities of *Hindostan* forming one of the several objects proposed by the institution of our Society, with the hope of communicating something acceptable on this head, I took the opportunity of a late excursion up the country to see the *Cave* which Mr. HODGKINS a few years since attempted to visit, at the desire, I believe, of the late Governor General, but was assassinated in his way to it by the followers of one of the rebellious allies of CHYT SING. On my describing it to the President, whom I had the pleasure to accompany, I was encouraged by him to think that a particular account of it would be curious and useful; and in consequence made a second visit to it from *Gyá*, when I took the following measurements, and, by the means of my *Moonshee*, a copy of the inscription on it, which I had despaired of presenting to you, but in its original language, (a *Pundit* at *Benáris* having attempted in vain to get it read during these last three months,) till the kind assistance of Mr. WILKINS enabled me to add the accompanying translation and remarks to what would otherwise have given little satisfaction.

The hill, or rather rock, from which the cavern is dug, lies about fourteen miles north of the ancient city of *Gyá*, and seems to be one of the south-

south-eastern hills of the chain of mountains called by RENNEL *Caramshah*, both being a short distance to the west of *Phulgó*.

It is now distinguished by the name of *Nágurjee*; but this may perhaps be a modern appellation; no mention of it being made in the inscription. Its texture is a kind of granite, called by the MOHUMMEDAN natives *Sung Kháreh*, which composes the whole rock, of a moderate height, very craggy and uneven, and steep in its ascent.

The cave is situated on the southern declivity, about two thirds from the summit: a tree immediately before it prevents its being seen from the bottom. It has only one narrow entrance, from the south, two feet and a half in breadth, six feet high, and of thickness exactly equal. This leads to a room of an oval form, with a vaulted roof, which I measured twice, and found to be forty-four feet in length from east to west, eighteen feet and a half in breadth, and ten feet and a quarter in height at the centre. This immense cavity is dug entirely out of the solid rock, and is exceedingly well polished, but without any ornament. The same stone extends much further than the excavated part, on each side of it, and is altogether, I imagine, full a hundred feet in length. The inhabitants near know nothing of its history or age; but I learnt from the chief of a neighbouring village, that a tradition is extant of a MOHUMMEDAN, named MINHA'J-U-DEEN, having performed his *cheelah*, or forty days in devotion, in this cavern; and that he was cotemporary with MUKHDOOM SHERF-U-DEEN, a venerated *walee*, who died in *Behár* in the 590th year of the *Hijree*; and he even went so far as to aver that he himself was descended from MINHA'J U-DEEN, and had records at *Patna* of his family's genealogy to the present time. What credit is due to this I will not pretend

is lost, but the room is certainly now frequented by MOHUMMEDANS, and has been for some time, as there are the remains of an old mosque built before it; and within a raised terrace, such as the MOHUMMEDAN, devotees are used to construct for their religious retirement. There are two inscriptions, one on each side of the interior part of the entrance; impressions of both which my *Moonshee* took off in the course of three days, with much trouble, and sufficient accuracy, to enable Mr. WILKINS to understand and explain the whole of one; though many *Pundits*, I was informed, who had seen the original engraving, had attempted in vain to decypher it. The other, which consists of one line only, is unfortunately of a different character, and remains still unintelligible.

The following letter and remarks, which Mr. WILKINS has favoured me with, make it unnecessary for me to say any thing of the contents of the inscription. I can only regret with him that the date is yet undiscovered; as what is now but a gratification of curiosity, might then have been a valuable clue to the illustration of obscure events in ancient history. There are, however, several other *caves* in the adjoining hills, which I likewise visited, but had not time to take the inscriptions: and from these, I hope, a date will be discovered.

Were any other testimony, besides the inscription, wanted, to shew that these *caves* were religious temples, the remains of three defaced images near another, which I visited, called *Curram Chossar*, would be sufficient proof of it. A third, the name of which I could not learn, has its entrance very curiously wrought with elephants and other ornaments, of which I hope in a short time to present a drawing to the Society.





## A LETTER FROM CHARLES WILKINS, ESQ.

## TO THE SECRETARY.

DEAR SIR,

HAVING been so fortunate as to make out the whole of the very curious Inscription you were so obliging as to lend me, I herewith return it, accompanied by an exact Copy, in a reduced size, interlined with each corresponding letter in the modern *Dēunāgār* character; and also a Copy of my Translation, which is as literal as the idioms would admit it to be.

The character is undoubtedly the most ancient of any that have hitherto come under my inspection. It is not only dissimilar to that which is now in use, but even very materially different from that we find in inscriptions of eighteen hundred years ago. But though the writing be not modern, the language is pure *Samskṛit*, written in a long verse, called *Sar-dōlā-vākkrēerēti*, and consists of four pauses, of nineteen syllables each, in this form:

.....

The only help was no small help in decyphering the vowels.

The allusions of the first verse allude to the story of *Bhāmānī*'s killing the evil spirit *Māhāshās*, who, in the disguise of a buffalo, as the name imports, fought with *Eendrā*, and his celestial bands, for a hundred years,



years, defeated him, and usurped his throne. The story is to be found at large in a little book called *Chandee*. The vanquished spirits, being banished the heavens, and doomed to wander the earth, after a while assemble, with their chief *Eendra* at their head, and resolve to lay their grievances before *Vēśhnōō* and *Sēēv*. Conducted by *Brāhmā*, they repair into the presence of those Deities, who heard their complaints with compassion; and their anger was so violent against *Māhēśhāsōōr*, that a kind of flame issued from their mouths, and from the mouths of the rest of the principal Gods, of which was formed a Goddess of inexpressible beauty with ten arms, and each hand holding a different weapon. This was a transfiguration of *Bhāwānēē*, the consort of *Sēēv*, under which she is generally called *Dōōrgā*. She is sent against the usurper. She mounts her lion, the gift of the mountain *Hēēmālāy*, (snowy,) and attacks the monster, who shifts his form repeatedly; till at length the Goddess planteth her foot upon his head, and cuts it off with a single stroke of her sword. Immediately the upper part of a human body issues through the neck of the headless buffalo, and aims a stroke, which being warded off by the lion with his right paw, *Dōōrgā* puts an end to the combat, by piercing him through the heart with a spear. I have in my possession a statue of the Goddess with one foot on her lion, and the other on the monster, in the attitude here lastly described.

The want of a date disappointed my expectations. I had some hopes that it was contained in the single line, which you informed me was taken from another part of the *cave*; but, although I have not yet succeeded in making out the whole, I have discovered enough to convince me that it contains nothing but an invocation. If you should be so fortunate as to obtain

tain correct copies of the rest of the inscriptions that are to be found in the *caves* of those mountains, I make no doubt but that we shall meet with some circumstance or other that will guide us to a discovery of their antiquity.

I have the pleasure to subscribe myself,

DEAR SIR,

Your very sincere Friend,

And obedient humble Servant,

CHARLES WILKINS.

*Calcutta, 17th March 1785.*

## A TRANSLATION OF A SANSKRIT INSCRIPTION.

**W**HEN the foot of the Goddess (*a*) was, with its tinkling ornaments, planted upon the head of *Mūhēśhāsūr*, (*b*), all the bloom of the new-blown flower of the fountain (*c*) was disperfed with disgrace by its superior beauty. May that foot, radiant with a fringe of refulgent beams issuing from its pure bright nails, endue you with a steady and an unexampled devotion, offered up with fruits, and shew you the way to dignity and wealth !

The illustrious *Yāgnā Vārmā* was a prince whose greatness consisted in free-will offerings. His reputation was as unfulfilled as the moon. He was renowned amongst the martial tribes ; and although he was, by descent, by wisdom, courage, charity, and other qualities, the fore-leader of the royal line ; yet, from the natural humility of his temper, he disturbed not the powerful ocean.

His auspicious son, *Sārdōolā Vārmā*, a prince whose magnificence flowed, as it were, from the tree of imagination, (*d*), displayed the ensign of royalty in sacrifices, and the world was subdued by his infinite renown. He gratified the hopes of relations, friends, and dependants ; and honour was achieved from the deed of death (*e*) near the uprising ocean.

(*a*) *Rbūwānīt*, the wife of *Sev*.

(*b*) The name of an evil spirit.

(*c*) Epithet of the lotus.

(*d*) In the original *Kālpā-tārō*, a fabulous tree which yielded every thing that was demanded.

(*e*) He was probably carried to *Gāṅgā-Sāgār* to die.

By his pious son, called *Anāntā Varmā* because of his infinite renown, the holy abode of us contemplative men, who are always studious for his good, and employed in his service, hath been increased, and rendered famous, as long as the earth, the sun, and moon, and starry heaven, shall endure; and *Kātyāyānīc* (*f*) having taken sanctuary, and being placed, in this cavern of the wonderful *Ven'dyū* (*g*) mountains.

The holy prince gave unto *Bhāwānēē*, in perpetuity, the village ——— (*h*) and its hilly lands, by whose lofty mountain-tops the sunny beams are cast in shade. Its filth and impurities are washed away by the precious stores of the *Māhānādā*, (*i*,) and it is refreshed by the breeze from the waving *Prēṣyāngūś* (*k*) and *Bāhōlās* (*l*) of its groves.

(*f*) One of the names of *Dūrṣā* or *Būwānēē*.

(*g*) The name of the chain of mountains which commences at *Chuna*.

(*h*) The name, which consisted of two long syllables, is wanting in the original.

(*i*) Probably the river called *Mahana* in RILEY'S Map of South *Bahar*.

(*k*) Probably the *Champa*.

(*l*) *Maulferrer*.

## XI.

## TRANSLATION OF A SANSKRIT INSCRIPTION,

COPIED FROM A STONE AT BÖÖD-DHĀ-GĀYĀ,

BY MR. WILMOT, 1785.

TRANSLATED BY CHARLES WILKINS, Esq.

**I**N the midst of a wild and dreadful forest, flourishing with trees of sweet-scented flowers, and abounding in fruits and roots, infested with lions and tigers, destitute of human society, and frequented by the *Moonees*, resided *Bööd-dhā*, the Author of Happiness, and a portion of *Varayan*. This Deity *Hūiřř*, who is the Lord *Hārēsa*, the possessor of all, appeared in this ocean of natural beings at the close of the *Devūpārē*, and beginning of the *Kālēř Yoog*: He who is omnipresent, and everlastingly to be contemplated, the Supreme Being, the Eternal One, the Divinity worthy to be adored by the most praise-worthy of mankind, appeared here with a portion of his divine nature.

Once upon a time the illustrious *Āmārā*, renowned amongst men, coming here, discovered the place of the Supreme Being, *Bööd-dhā*, in the great forest. The wife *Āmārā* endeavoured to render the God *Bööd-dhā* propitious by superior service; and he remained in the forest for the space of twelve years, feeding upon roots and fruits, and sleeping upon the bare earth; and he performed the vow of a *Moonee*, and was without transgression. He performed acts of severe mortification, for he was a man of infinite resolution, with a compassionate heart. One night he had a vision, and heard a voice, saying, "Name whatever boon thou wantest." *Āmārā*  
*Deva,*

*Deva*, having heard this, was astonished, and with due reverence replied, "First, give me a visitation, and then grant me such a boon." He had another dream in the night, and the voice said, "How can there be an apparition in the *Kālēṣṣ Yoog*? The same reward may be obtained from the sight of an image, or from the worship of an image, as may be derived from the immediate visitation of a deity." Having heard this, he caused an image of the Supreme Spirit *Bhōd-dhā* to be made, and he worshipped it, according to the law, with perfumes, incenses, and the like; and he thus glorified the name of that Supreme Being, the incarnation of a portion of *Veeshnoo*: "Reverence be unto thee in the form of *Bhōd-dhā*! Reverence be unto the Lord of the Earth! Reverence be unto thee, an incarnation of the Deity and the Eternal One! Reverence be unto thee, O God, in the form of the God of Mercy; the dispeller of pain and trouble, the Lord of all things, the Deity who overcometh the sins of the *Kālēṣṣ Yoog*, the Guardian of the Universe, the Emblem of mercy towards those who serve thee—*Om*! the possessor of all things in vital form! Thou art *Brahmā*, *Veeshnoo*, and *Māhesa*! Thou art Lord of the Universe! Thou art, under the proper form of all things moveable and immovable, the possessor of the whole! and thus I adore thee. Reverence be unto the bestower of salvation, and, *Resheekśā*, the ruler of the faculties! Reverence be unto thee (*Kṣarā*) the Destroyer of the Evil Spirit *Kēśe*! O, *Dāmōdārā*, shew me favour! Thou art he who resteth upon the face of the milky ocean, and who lyeth upon the serpent *Sēśā*! Thou art *Trēṣṣēkrāmā*, (who at three strides encompassed the Earth!) I adore thee, who art celebrated by a thousand names, and under various forms in the shape of *Bhōd-dhā*, the God of Mercy! Be propitious, O Most High God!"

Having thus worshipped the guardian of mankind, he became like one of the just. He joyfully caused a holy temple to be built, of a wonderful construction, and therein were set up the divine foot of *Veeshnoo*, for ever purifier of the sins of mankind, the images of the *Pāṇḍōs*, and of the descents of *Veeshnoo*, and in like manner of *Brāhmā*, and the rest of the divinities.

This place is renowned; and it is celebrated by the name of *Bōdd-dhā Gāyā*. The forefathers of him who shall perform the ceremony of the *Sradha* at this place shall obtain salvation. The great virtue of the *Sradha* performed here, is to be found in the book called *Vāyō-pūrāṇā*; an epitome of which hath by me been engraved upon stone.

*Īśhrāmādētyā* was certainly a king renowned in the world. So in his court there were nine learned men, celebrated under the epithet of the *Nāvā-ratnāṇī*, or nine jewels; one of whom was *Āmārā Dēvā*, who was the king's chief counsellor, a man of great genius and profound learning, and the greatest favourite of his prince. He it certainly was who built the holy temple which destroyeth sin, in a place in *Jamboodweep*, where, the mind being steady, it obtains its wishes, and in a place where it may obtain salvation, reputation, and enjoyment, even in the country of *Bhārātā*, and the province of *Kēśhātā*, where the place of *Bōdd-dhā*, purifier of the sinful, is renowned. A crime of an hundred fold shall undoubtedly be expiated from a sight thereof, of a thousand fold from a touch thereof, and of a hundred thousand fold from worshipping thereof. But where is the use of saying so much of the great virtues of this place? Even the hosts of heaven worship with joyful service both day and night.

That

That it may be known to learned men, that he verily erected the house of *Bōd-dhā*, I have recorded, upon a stone, the authority of the place, as a self-evident testimony, on Friday, the fourth day of the new moon, in the month of *Madhoo*, when in the seventh or mansion of *Gāniśā*, and in the year of the Era of *Vēṣṭhrāmādeṣṭiyā* 1005.



## XII.

To

SECRETARY TO THE ASIATICK SOCIETY.

SIR,

**B**EFORE I left *Calcutta*, a gentleman, with whom I chanced to be discoursing of that sect of people who are distinguished from the worshippers of *Bråhm*, and the followers of MAHOMMED, by the appellation *Seeh*, informed me that there was a considerable number of them settled in the city of *Patna*, where they had a college for teaching the tenets of their philosophy. As *Patna* was in my way to *Banaris*, I no sooner arrived there, than I inquired after the college, and I was presently conducted to it; and I now request you will please to lay before the society the few observations and inquiries which a single visit of about two hours would admit of my making. If, such as they are, they should hereafter be found useful, either as a clew to guide another in his researches in the same path, or to add to some future account to render it more complete, my end in troubling you to lay it before the society is fully answered.

I have the honour to subscribe myself,

SIR,

Your most obedient humble servant,

CHARLES WILKINS.

*Banaris, 1st March, 1781.*

OBSERVATIONS

OBSERVATIONS on the *SEEKS* and their *COLLEGE*.

I FOUND the College of the *Seeks* situated in one of the narrow streets of *Patna*, at no very considerable distance from the Custom-house. I was permitted to enter the outward gate; but as soon as I came to the steps which led up into the Chapel, or public hall, I was civilly accosted by two of the Society. I asked them if I might ascend into the hall. They said it was a place of worship, open to me and to all men; but, at the same time, intimated, that I must take off my shoes. As I consider this ceremony in the same light as uncovering my head upon entering any of our temples dedicated to the Deity, I did not hesitate to comply; and I was then politely conducted into the hall, and seated upon a carpet in the midst of the assembly, which was so numerous as almost to fill the room. The whole building forms a square of about forty feet, raised from the ground about six or eight steps. The hall is in the center, divided from four other apartments by wooden arches, upon pillars of the same materials, all neatly carved. This room is rather longer than it is broad. The floor was covered with a neat carpet, and furnished with six or seven low desks, on which stood as many of the books of their law; and the walls, above the arches were hung with European looking-glasses in gold frames, and pictures of *Mussulman* Princes and *Hindoo* Deities. A little room, which, as you enter, is situated at the left-hand end of the hall, is the chancel, and is furnished with an altar covered with a cloth of gold, upon which was laid a round black shield over a long broad sword, and on either side a *chowry* of peacock's feathers, mounted in a silver handle. The altar was raised a little above the ground, in a declining position. Before it stood a low kind of throne plated with silver; but rather too small to be useful: about it were several silver flower-pots and rose-water

bottles; and on the left hand stood three small *urns*, which appeared to be copper, furnished with notches to receive the donations of the charitable. There stood also near the altar, on a low desk, a great book, of a folio size, from which some portions are daily read in their divine service. It was covered over with a blue mantle, on which were printed, in silver letters, some select passages of their law.

After I had had a long conversation with two of the congregation, who had politely seated themselves on each side of me on the carpet, and whom I found very intelligent, notice was given that it was noon, and the hour of divine service. The congregation arranged themselves upon the carpet, on each side of the hall, so as to leave a space before the altar from end to end. The great book, desk, and all, was brought, with some little ceremony from the altar, and placed at the opposite extremity of the hall. An old man, with a reverend silver beard, kneeled down before the desk with his face towards the altar; and on one side of him sat a man with a small drum, and two or three with cymbals. The book was now opened, and the old man began to chant to the time of the drum and the cymbals; and, at the conclusion of every verse, most of the congregation joined chorus in a response, with countenances exhibiting great marks of joy. Their tones were by no means harsh; the time was quick; and I learnt that the subject was a Hymn in praise of the unity, the omnipresence, and the omnipotence, of the Deity. I was singularly delighted with the gestures of the old man: I never saw a countenance so expressive of inexpressible joy, whilst he turned about from one to another, as it were, bespeaking their assents to those truths which his very soul seemed to be engaged in chanting forth. The Hymn being concluded, which consisted of about twenty verses, the whole congregation got up, and presented their faces with

with joined hands towards the altar, in the attitude of prayer. A young man now stood forth; and, with a loud voice and distinct accent, solemnly pronounced a long prayer, or kind of liturgy, at certain periods of which all the people joined in a general response, saying *Wā Gooroo!* They prayed against temptation; for grace to do good; for the general good of mankind; and a particular blessing to the *Seeks*; and for the safety of those who at that time were on their travels. This prayer was followed by a short blessing from the old man, and an invitation to the assembly to partake of a friendly feast. The book was then closed, and restored to its place at the altar; and the people being seated as before, two men entered bearing a large iron caldron, called a *curray*, just taken from the fire, and placed it in the center of the hall upon a low stool. These were followed by others with five or six dishes, some of which were of silver, and a large pile of leaves, sewed together with fibres, in the form of plates. One of these plates was given to each of the company without distinction; and the dishes being filled from the caldron, their contents were served out till every one had got his share. Myself was not forgotten; and, as I was resolved not to give them the smallest occasion for offence, I ate up my portion. It was a kind of sweetmeat, of the consistence of soft brown sugar, composed of flower and sugar mixed up with clarified butter, which is called *ghee*. Had not the *ghee* been rancid, I should have relished it better. We were next served with a few sugar plums: and here ended the feast and the ceremonies of the day. They told me the religious part of the ceremony was daily repeated five times. I now took my leave, inviting some of the principal men amongst them, who were about to return to their own country through *Banaris*, to pay me a visit.

In the course of the conversation I was engaged in with the two *Seeks* before the service, I was able to gather the following circumstances. That the founder of their faith was called *Nāneek Sah*, who flourished about four hundred years ago at *Punjab*, and, who, before his apostasy, was a *Hindoo* of the *Kshétry*, or military tribe; and that his body disappeared as the *Hindoo*s and the *Mussulmans* were disputing for it; for upon their removing the cloth which covered it, it was gone; that he left behind him a book, composed by himself, in verse, and the language of *Punjab* (but a character partly of his own invention;) which teaches the doctrines of the faith he had established: that they call this character, in honour of their founder, *Gooroo-Mooke*: "*from the mouth of the preceptor.*" That this book, of which that standing near the altar, and several others in the hall, were copies, teaches that there is but one God, omnipotent and omnipresent; filling all space, and pervading all matter; and that he is to be worshipped and invoked. That there will be a day of retribution, when virtue will be rewarded and vice punished; (I forgot to ask in what manner.) That it not only commands universal toleration, but forbids disputes with those of another persuasion. That it forbids murder, theft, and such other deeds as are, by the majority of mankind, esteemed crimes against society; and inculcates the practice of all the virtues, but particularly an universal philanthropy, and a general hospitality to strangers and travellers. This is all my short visit would permit me to learn of this book. It is a folio volume, containing about four or five hundred pages.

They told me further, that some years after this book of *Nāneek Sah* had been promulgated, another made its appearance, now held in almost as much esteem as the former. The name of the author has escaped my memory;

memory; but they favoured me with an extract from the book itself in praise of the Deity. The passage had struck my ear on my first entering the hall, when the students were all engaged in reading. From the similarity of the language to the *Hindoovee*, and many *Shanscrit* words, I was able to understand a good deal of it; and I hope, at some future period, to have the honour of laying a Translation of it before the Society. They told me I might have copies of both their books, if I would be at the expence of transcribing them.

I next inquired why they were called *Seeks*, and they told me it was a word borrowed from one of the commandments of their founder, which signifies, "*Learn thou*;" and that it was adopted to distinguish the sect soon after he disappeared. The word, as is well known, has the same import in the *Hindoovee*.

I asked them what were the ceremonies used in admitting a profelyte. A person having shewn a sincere inclination to renounce his former opinions to any five or more *Seeks* assembled together, in any place, as well on the highway as in a house of worship, they send to the first shop where sweetmeats are sold, and procure a small quantity of a particular sort, which is very common, and, as I recollect, they call *Batāsa*; and having diluted it in pure water, they sprinkle some of it on the body, and into the eyes of the convert; whilst one of the best instructed repeats to him, in any language with which he is conversant, the chief canons of their faith, exacting from him a solemn promise to abide by them the rest of his life. This is the whole of the ceremony. The new convert may then choose a *Gooroo*, or preceptor, to teach him the language of their scriptures, who first gives him the alphabet to learn, and to lead

him

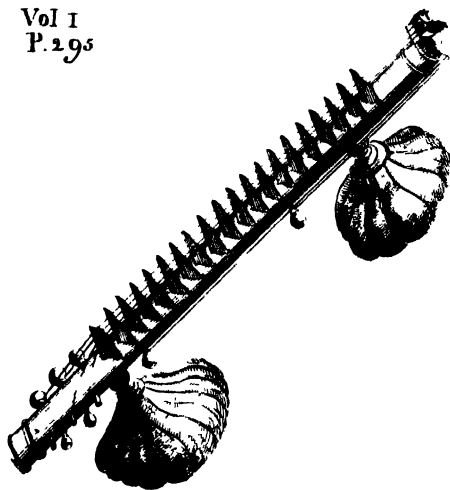
him on, by slow degrees, until he wants no further instruction. They offered to admit me into their Society, but I declined the honour; contenting myself with the alphabet, which they told me to guard as the apple of my eye, as it was a sacred character. I find it differs but little from the *Dewnagur*: the number, order, and powers, of the letters are exactly the same. The language itself is a mixture of *Persian*, *Arabic*, and some *Shanscrit*, grafted upon the provincial dialect of *Punjab*, which is a kind of *Hindoozee*, or, as it is vulgarly called by us, *Moors*.







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## XIII.

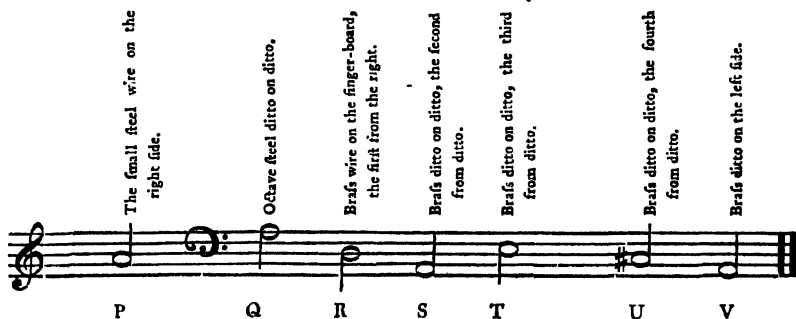
*An EXTRACT of a LETTER from FRANCIS FOWKE, Esq.*

TO THE PRESIDENT.

THE drawings of *JEEWUN SHAH* and the *Been* will be dispatched in a small boat to-morrow. You wished to have had the two attendant musicians in the same drawing with *JEEWUN SHAH*; but the draftsman was not equal to the perspective of this; he would have run all the figures one into the other: and as he has succeeded tolerably well with the principal figures, I thought it was better to be sure of that, especially as the other figures can easily be added by a *European* artist. I have a double pleasure in sending you the enclosed account of the *Been*. In obliging you, I look forward to the instructive amusement I shall share with the public at large in the result of your researches into this subject of *Indian* music; and I am exceedingly happy, by furnishing you with facts, highly necessary indeed, but the mere work of care and observation, to give you greater leisure for the contemplation of the whole. You may absolutely depend upon the accuracy of all that I have said respecting the construction and scale of this instrument. It has all been done by measurement: and, with regard to the intervals, I would not depend upon my ear, but had the *Been* tuned to the harpsichord, and compared the instrument carefully, note by note, more than once. What I myself am aware of, will certainly not escape your penetration, that there may be a little of the bias of hypothesis, or an opinion pretty strongly established, in what I have said of the confined modulation of the *Indian* music. But it is easy to separate my experiments and conjectures; and my prejudices cannot mislead you, though they may possibly suggest a useful hint, as half errors often do.

THE

THE *Been* is a fretted instrument of the guitar kind. The finger-board is  $21\frac{1}{8}$ ths inches long. A little beyond each end of the finger-board are two large gourds, and beyond these are the pegs and tail-piece which hold the wires. The whole length of the instrument is three feet seven inches. The first gourd is fixed at ten inches from the top, and the second at about two feet  $11\frac{1}{2}$ . The gourds are very large, about fourteen inches diameter, and have a round piece cut out of the bottom, about five inches in diameter. The finger-board is about two inches wide. The wires are seven in number, and consist of two steel ones, very close together, in the right side; four brass ones on the finger-board; and one brass one on the left side. They are tuned in the following manner.

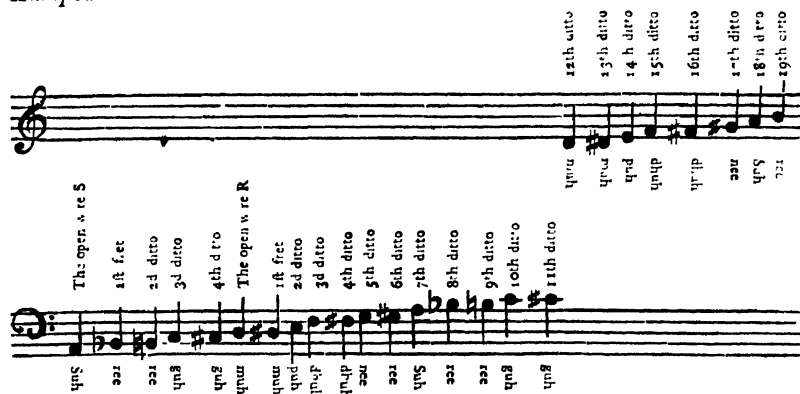


The great singularity of this instrument is the height of the frets; that nearest the nut is one inch  $\frac{1}{2}$ , and that at the other extremity about  $\frac{1}{4}$ ths of an inch, and the decrease is pretty gradual. By this means the finger never touches the finger-board itself. The frets are fixed on with wax by the performer himself, which he does intirely by ear. This was asserted by PEAR CAWN, the brother of JEEWUN SHAH, who was ill at the time;

but

but PEAR CAWN is a performer very little, if at all, inferior to JELWON SHAH. The frets of PEAR CAWN's instrument were tolerably exact: any little difference is easily corrected by the pressure of the finger. Indeed, the performers are fond, on any note that is at all long, of pressing the string very hard, and letting it return immediately to its natural tension, which produces a sound something like the close shake on the violin; but not with so agreeable an effect, for it appears sometimes to alter the sound half a tone.

The frets are nineteen in number. The notes that they give will appear on the following scale. I have added below the names which the performer himself gives to the notes in his own language. It is very observable, that the semitones change their names on the same semitone as in the *European* scale.



On the wires R and S, which are those principally used, there is an extent of two octaves, a whole note with all the half notes, complete in the first octave, but the  $g\sharp$  and  $b\flat$  wanting in the second. The performer's apo-

logy for this was, that he could easily get those notes by pressing the string a little hard upon the frets f  $\sharp$  and a  $\natural$ , which is very true from the height of the frets; but he asserted that this was no defect in his particular instrument, but that all *Beens* were made so. The wires TU are seldom used except open.

The *Been* is held over the left shoulder, the upper gourd resting on that shoulder, and the lower one on the right knee.

The frets are stopped with the left-hand, the first and second fingers are principally used. The little finger of the hand is sometimes used to strike the note V. The third finger is seldom used, the hand shifting up and down the finger-board with great rapidity. The fingers of the right hand are used to strike the strings of this hand; the third finger is never used. The two first fingers strike the wires on the finger-board, and the little finger strikes the two wires. The two first fingers of this hand are defended by a piece of wire put on the tops of them in the manner of a thumb when the performer plays strong, this causes a very jarring disagreeable sound; whereas, when he plays softly, the tone of the instrument is remarkably pleasing.

The style of music on this instrument is in general that of great execution. I could hardly ever discover any regular air or subject. The music seems to consist of a number of detached passages, some very regular in their ascent and descent: and those that are played softly, are most of them both uncommon and pleasing.

The

The open wires are struck, from time to time, in a manner that, I think, prepares the ear for a change of modulation, to which the uncommonly full and fine tones of these notes greatly contribute; but the ear is, I think, always disappointed: and, if there is ever any transition from the principal key, I am inclined to think it is very short. Were there any other circumstances respecting the *Indian* music, which led to suppose that it has, at some period, been much superior to the present practice, the style, scale, and antiquity of this instrument, would, I think, greatly confirm the supposition.

## XIV.

## A DESCRIPTION OF THE MÁHWAH TREE.

By LIEUTENANT CHARLES HAMILTON.

THESE is a very curious and useful tree called by the Natives of *Bahar*, and the neighbouring countries, the *Máhwah* or *Máwee*; its name, as written by them, being *o37* ; but the Sanscrit name is *Madhúca* or *Madhudruma*.

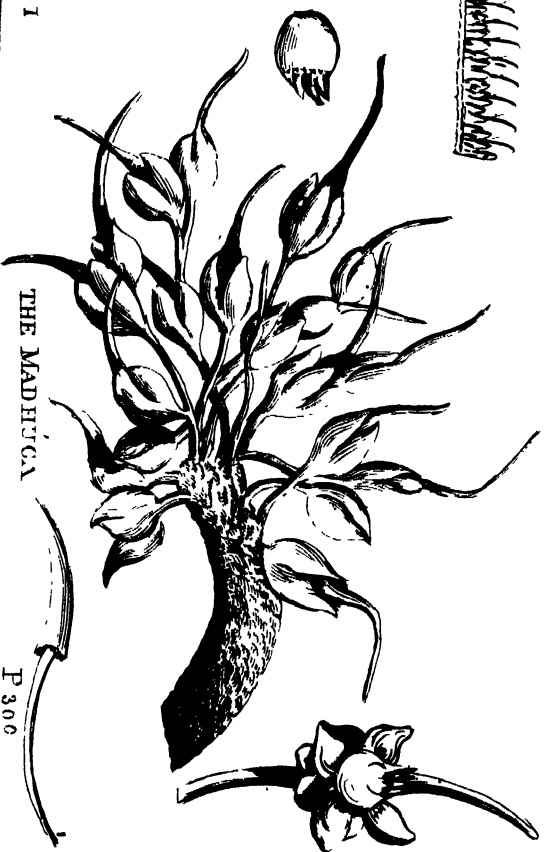
It is of the class of the *Polyandria Monogynia*, of *Linnaeus*, but of a genus not described by him.

The calyx is *monophyllous*, quadrifid, half divided, and imbricated in its divided part; the two opposite and *outer* covering in part, the two opposite and *inner*, parts.

The *corolla* is *monopetalous*, having an inflated tube for its lower part of near an inch long, thick, fleshy, and of a cream colour from this arise nine small leaves, as it were, like petals, from a calyx, that are imbricated and twisted, one over the other, from right to left, clasping the lower part of the style in a point; but which they seem to serve, in some respects, like a forceps, to detach the whole *corolla* at the season of its dropping.

There are no filaments; but the *antheræ*, which are in number most commonly

*Asplenium adnigrum*



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commonly twenty-six, long, scabrous, and spear-headed, are inserted in rows, on the inside and upper part of the tube of the *corolla*.

The style is long, round, and tapering, and projects about an inch beyond the *corolla*. It is succeeded by a drupe, with a thick pericarpium, bilocular, containing two seeds or kernels covered with a dark brown skin. There are often, however, *three* of these in three separate divisions.

The flowers rise in bunches from the extremities of the smaller branches; and have each a pedicle of about an inch and a half long. These are mostly turned downwards, whence the *corollas* more easily drop off.

The tree, when full grown, is about the size of a common *mango-tree*, with a bushy head, and oval leaves, a little pointed. Its roots spreading horizontally, are sunk but little in the earth. The trunk, which is often of a considerable thickness, rises seldom to any great height, without giving off branches; it is, however, not uncommon to see it shoot up clear to the length of eight or ten feet. The wood itself is moderately hard, fine grained, and of a reddish colour.

By incision, the tree affords a resinous *gum* from the bark.

The flowers are of a nature very extraordinary, differing essentially from those of any other plant with which I am acquainted, as they have not, in any respect the usual appearance of such, but rather resemble *coriaries*, and I, like many others, had long conceived them to be the *fruit* of the *Muhwah*. The tree drops its leaves in the month of February; and

early in March these flowers begin to come out in clusters of thirty, forty, or fifty, from the extremity of every small branch ; and, from this period till the latter end of April, as the flowers come to maturity, (for they never open or expand,) they continue falling off, with their *antheræ*, in the mornings, a little after sun-rise, when they are gathered ; and afterwards dried by an exposure of a few days in the sun : when thus prepared, they very much resemble a dried *grape*, both in taste and flavour.

Immediately after the flowers drop off, fresh shoots are made for the new leaves, which soon make their appearance ; coming presently to their full growth.

The fruit (*properly so called*) is of two sorts in shape ; the one resembling a small *walnut* ; the other somewhat larger, and pointed. It is ripe towards the middle of May, and continues dropping from the tree till the whole fall ; which is generally about the beginning or towards the middle of June. The outer covering, or *Pericarpium*, which is of a soft texture, commonly bursts in the fall, so that the seeds are very easily squeezed out of it. The seeds are somewhat of the shape, but longer than an *olive*.

These seeds are replete with a thick *oil*, of the consistence of *butter* or *ghee*, which is obtained by expression.

From this description it may easily be conceived that the *Mahwah tree*, and its productions, are of singular and general use, especially in those dry and barren countries which, from the nature of their situation, are not so well calculated for producing in plenty or perfection the other necessaries of life.

The

The *corolla*, or flowers, after being dried as before described, are eaten by the natives raw, or dressed with their *curries*; and, when even simply boiled with rice, they afford a strengthening and wholesome nourishment. They are, indeed, often applied to a less laudable purpose; for being fermented, they yield, by distillation, a strong spirit, which the people here sell so very cheap, that, for *one pice*, (about a half-penny), may be purchased no less than a *cutchaseer*, (above a pint *English*;) with which any man may get completely drunk. These flowers make an article of trade; being exported from this country to *Patna*, and elsewhere, in no inconsiderable quantities.

The *oil* yielded by the fruit, as before mentioned, resembles *ghee* so much, that, being cheaper, the natives often mix it with that commodity. They use it, the same as *ghee*, in their victuals, and in the composition of some sorts of sweetmeats; and burn it in their lamps. It is also regarded as a salutary remedy, applied exteriorly, to wounds, and all cutaneous eruptions. It is, at first, of the consistence of common *oil*, but soon coagulates. After being kept for some time, it acquires a bitterish taste and rancid smell, which renders it somewhat less agreeable as an article of food: but this is an inconvenience which, by the *oil* being properly clarified, and prepared at first, might be perhaps avoided. This *oil* is also exported, both in its adulterated and original state, to *Patna*, and other parts of the low country.

I do not know any purpose to which the *gum* has ever been applied, but if found, upon trial, to be of use, it might be collected in large quantities. The best season for this would be in the months of March and April, about the time the flowers come out, when the tree seems to be

most

most replete with it. Such an operation, indeed, would probably diminish its produce in the fruit and flower; but where it was sufficiently cultivated, the loss in those could be but little felt.

The wood, from what has been already said of it, cannot be expected to be often had in beams of any considerable length, so as to make it so very useful in building, as it would otherwise be, from its not being liable to be eat by the white ants. Mr. KIER, however, tells me that, when he was at *Chowsee*, (a village upon the *Cattamassa*, near *Buxar*,) he had beams of it, which were, to the best of his remembrance, above twenty feet long. But, in many other respects it is a most useful wood; and, as it is tough, and of a strong texture, it might, perhaps, be employed to advantage in ship building, in which case, if properly cultivated in many grounds that seem well adapted for it, and fit for little else, it might thus in time become a valuable article in that branch at *Calcutta*, whether it could easily be transported during the rainy season, from almost any part of these countries, by several rivers that are then sufficiently full to float it down.

The tree, I am told, will grow in the most barren ground, even amongst stones and gravel, where there is the least appearance of a soil; and it seems to destroy all the smaller trees and brushwood about it: yet it does not refuse a *rich* soil either. Mr. KIER having observed to me, that the few he had seen about *Buxar*, where it is certainly very good, were both taller, and seemed to thrive much better than any he had ever met with in *Ramgur*. It does not require much *moisture*, seeming to produce nearly as well in the driest as in most favourable years; and in every situation; and is therefore admirably fitted for the convenience of the inhabitants of these  
hilly

hilly countries, which are peculiarly subject to long and severe droughts during the hot months.

Yet, notwithstanding its utility, and the immense quantity of ground that seems so well adapted to the growth of it, both here, and in the neighbouring provinces of *Catak*, *Pacheet*, *Rotas*, &c. (the greatest part of which, indeed, seems fit for no other useful production, I have myself never observed, nor can I find any of my acquaintance who ever have remarked, one single tree in its infant state: we can see, every where, *full-grown* trees in great abundance; but never meeting with any young plants, both I, and all whom I have spoken to on the subject, are at some loss to conceive how they should have come here. Neither can the country people themselves, of whom I have inquired, give any rational account of this; although it appears pretty evident that numbers of them must have been cultivated some time or other, every village having many of them growing about it.

This is a circumstance which sufficiently marks the true character of the lower order of natives in their most supine indolence and sloth; owing chiefly, perhaps, to the ignorant and stupid rapacity of their *Rajahs*, *Zimeendars*, and other *landholders*, and their total inattention to the welfare of those dejected wretches, from whom they derive their consequence and power: of their base indifference to the interests of those whom they thus affect to hold beneath their regard, many striking instances occurred to me in the course of my inquiries upon this very subject; and it was not long ago that, asking some questions concerning the *Mahwah* of a *Zimeendar* in this neighbourhood, he answered, that "it was the 'food of the poor people, and how should he know any thing about it!'"

It was this strange neglect of the culture of it, and a knowledge of its usefulness, which first led me to inquire into the nature of this tree, from which the bulk of the people hereabouts already draw such great benefit; in order to know whether they might not increase it without any great trouble to themselves; and whether thereby the revenue might not also be increased, and a certain provision be made against famines, from which the natives often suffer severely in these higher districts.

To effect this, it would be necessary to give the *ryots* every possible encouragement to raise the tree from the seeds; but as the torpid apathy of these people, whether natural or acquired, will ever prevent their being moved to any exertion by a prospect, however alluring, of distant advantage, I apprehend the only way of bringing this about, would be making the planting and raising of a certain number of *Máhwahs* (in proportion to the value of the tenure) an article in their *Kabooleeats*, or agreements.

The tree, as has been already observed, will grow almost any where. It ought to be sown about the beginning of the rains, either in beds (to be afterwards transplanted) or at about thirty or forty feet distance, in the ground designed for it. It is said that, in seven years, the trees will give flowers and fruit; in ten, they will yield about half their common produce; and that in twenty years they come to their full growth; after which, if my information be good, they will last near one hundred years. This account, I acknowledge, must necessarily be very vague and uncertain; as I never have met with a single person who appeared to have had either opportunity or inclination to observe its progress. Such, however, is what the country people say of it.

I am told that a good tree will easily give four *puckha maunds* (about three hundred weight avoirdupois) of dried flowers, which will sell here for about two *rupees*; and of seeds it will afford about two *maunds*; and this, of *oil*, will yield twenty-six *seers puckha* weight (near 60lb.) which, in a year like this, when *oil* is cheap, will sell at this place for two *rupees* more. It is to be observed, however, that *every* tree will not give so much, neither are the flowers and *oil* so clear in any part of the hills as at *Chitra*; but, allowing only a *half* of this, or less, to be the product of each tree, (though it might be rendered still much greater by the very least care and industry in the cultivation of it,) within the space of twenty years, a subsistence might be raised to the inhabitants, and a considerable revenue to the proprietors of the lands, throughout an immense tract of country; the greatest part of which, in its present state, is little better than a barren waste, and cannot pay one single *anna* to the *Zimeendar* or the government. That such an advantage might be derived from it, may be proved by the most moderate calculation; for, supposing the trees to be sown at forty feet distance from each other, on each *begah* (about the third of an acre) might stand eight trees; and, supposing the product of each tree to be only *half a rupee*, there would be *four rupees* of *annual value* on a *begah* of ground; half of which going to the proprietor; it would thus give a far better rent than the generality of the best grounds in these parts; and the labourer would have a produce, without any other trouble than that of sowing the seed; and fencing the ground whilst the trees were young; and that of annually gathering the flowers, and preparing the *oil*, when they arrive at their proper size: and they would probably begin to give a produce within less than ten years after the sowing.

As this tree will yield nearly its usual quantity of flowers and fruit in seasons when, for want of rain, every other crop fails; if thus cultivated, it



would afford the inhabitants a sure and certain resource ; under the most dreadful, and what has hitherto been, to them, the most destructive of all calamities, famine. It is well known that the rice, and other sorts of grain, which form the chief part of their sustenance, require a considerable degree of moisture to bring them to perfection. An unusually dry season destroys the harvest in those articles, and reduces the *ryots* in general to the utmost misery ; a predicament into which they could hardly fall, even in the severest dearth of grain, whilst they had plenty of the flowers and fruit of the *Máhwah* to depend upon.

It may be here not improper to observe, that Mr. KEIR is now sowing a few acres with the seed of this useful tree, and means to fence it ; which may, perhaps in time, tempt others to follow so good an example.

*Chatra, Ramgur, July 6, 1785.*

## XV.

## OF THE METHOD OF DISTILLING,

*As practised by the NATIVES at CHATRA in RAMGUR, and in the other Provinces, perhaps, with but little Variation.*

By ARCHIBALD KEIR, Esq.

THE body of the still they use is a common, large, unglazed, earthen water jar, nearly globular, of about twenty-five inches diameter at the widest part of it, and twenty-two inches deep to the neck, which neck rises two inches more, and is eleven inches wide in the opening. Such, at least, was the size of the one I measured; which they filled about a half with fomented *Máhwah-flowers*, that swam in the liquor to be distilled.

The jar they placed in a furnace, not the most artificial, though seemingly not ill adapted to give a great heat with but a very little fuel. This they made by digging a round hole in the ground, about twenty inches wide, and full three feet deep; cutting an opening in the front, sloping down to the bottom, on the sides perpendicular, of about nine inches wide, and fifteen long, reckoning from the circle where the jar was to come, to serve to throw in the wood at, and for a passage to the air. On the side too they cut another small opening, of about four inches by three; the jar, when placed, forming one side of it, to serve as a chimney for the smoke to go out at. The bottom of the earth was rounded up like a cup. Having then placed the jar in this, as far as it would go down, they covered it above, all round, with clay, except at the two openings, till within about a fifth of its height; when their furnace was completed.

In this way, I reckon there was a full third of the surface of the body of the still, or jar, exposed to the flame, when the fire came to be lighted; and its bottom, not reaching to within two feet of where the fuel was, left a capacious hollow between them, whence the wood, that was short and dry, when lighted, being mostly converted into flame, and circulating on so great a surface of the still, gave a much stronger heat than could else have been produced from so very little fuel; a consideration well worth the attention of a manufacturer, in our country more especially, where firing is so dear. There indeed, and particularly as coal is used, it would be better, no doubt, to have a grate; and that the air should enter from below. As to the benefit resulting from the body of the still being of earthen-ware, I am not quite so clear in it. Yet, as lighter substances are well known to transmit heat more gradually and slowly than the more solid, such as metals, may not earthen vessels, on this account, be less apt to burn their contents, so as to communicate an empyreumatick taste and smell to the liquor that is distilled, so often, and so justly complained of, with us? At any rate, in this country, where pots are made so cheap, I should think them greatly preferable, as, at least, much less expensive than those which the gentlemen engaged in this manufacture most commonly employ: though of this they are best able to judge.

Having thus made their furnace, and placed the body of the still in it, as above described, they to this luted on, with moistened clay, to its neck, at the opening, what they here call an *adhur*; forming with it, at once, a cover for the body of the still, with a suitable perforation in it to let the vapour rise through, and the under part of the alembick. The *adhur* was made with two earthen pans, having round holes in their middles, of about four inches diameter; and, their bottoms being turned opposite

posite the one to the other, they were cemented together with clay; forming a neck of junction thus of about three inches, with the small rising on the upper pan. The lowermost of these was more shallow, and about eleven inches wide, so as to cover exactly the opening at the neck of the jar, to which they luted it on with clay. The upper and opposite of these was about four inches deep, and fourteen inches wide, with a ledge round its perforation in the middle, rising, as is already said, from the inner side of the neck, of about half an inch high, by which a gutter was formed to collect the condensed spirit as it fell down; and from this there was a hole in the pan to let it run off by; to which hole they occasionally luted on a small hollow *bamboo*, of about two feet and a half in length, to convey it to the receiver below. The upper pan had also another hole in it, of about an inch square, at near a quarter of its circumference from the one below just spoken of, that served to let off the water employed in cooling, as shall be mentioned presently.

Their *adkur* being thus fitted to the jar, they completed the alcmbick by taking a copper-pot, such as we use in our kitchens, of about five inches deep, eight wide at the mouth, and ten at the bottom, which was rather flattish; and turning its mouth downward, over the opening in the *adkur*, luted it down on the inside of the jar with clay.

For their cooler they raised a seat, close upon, and at the back part of, the furnace, about a foot higher than the bottom of the copper-pot. On this they placed a two or three gallon pot, with a round hole, of about half an inch in the side of it; and to this hole, before they lighted their fire, they luted on a short tube of a like bore; placing the pot, and directing its spout so as that, when filled with water, it threw a constant and uniform

uniform stream of it, from about a foot high, or near the center of the bottom of the copper-pot, where it was diffused pretty completely over its whole surface; and the water falling down into the upper part of the pan of the *adkur*, it thence was conveyed through the square hole, already mentioned, by a trough luted on to it for that purpose, to a cooling recevoir a few feet from the furnace; from which they took it up again to supply the upper pot, as occasion required.

As their stock of water, however, in this sort of circulation, was much smaller than it seemingly ought to have been, being scarcely more than six or eight gallons, it too soon became hot; yet, in spite of this disadvantage, that so easily might have been remedied, and the shortness of the conducting tube, which had nothing but the common air to cool it, there ran a stream of liquor from the still; and but very little vapour rising from it; beyond any thing I had ever seen from stills of a much larger size, fitted with a worm and cooler. In about three hours time, indeed, from their lighting of the fire, they drew off full fifteen bottles of spirit; which is more, by a great deal, I believe, than could have been done in our way from a still of twice the dimensions.

The conveniences of a worm and cooler, which are no small expence either, I have myself often experienced; and if these could be avoided in so simple a way, that might easily be improved, the hints that are here offered may be of some use. The thin metal head is certainly well adapted, I think, to transmit the heat to the water, which is constantly renewed; and which, if cold, as it ought to be, must absorb the fastest possible: whereas, in our way, the water being confined in a tub, that, from the nature of its porous substance, in a great degree rather retains than lets the  
heats

heats pass away, it soon accumulates in it, and becomes very hot ; and though renewed pretty often, never answers the purpose of cooling the vapour in the worm so expeditiously and effectually as is done by their more simple and less expensive apparatus. In this country more especially, where labour and earthen-wares are so cheap, for as many *rupees*, and less, twenty furnaces with stills, and every thing belonging to them, independent of the copper-pots, might very well be erected, that would yield above a hundred gallons of spirits a day ; allowing each still to be worked only twice. So very cheap, indeed is arrack here, to the great comfort of my miners, and of many thoughtless people beside, that for one single *peysa*, (not two farthings sterling,) they can get a whole *cutchaseer* of it in the *bazar*, or above a full *English* pint, and enough to make them completely intoxicated ; objects often painful to be seen.

Of the superior excellence of metal in giving out heat from itself, and from vapour contained in it, we have a very clear proof, in what is daily performed on the cylinder of the steam engine : for cold water being thrown on it when loaded, the contained vapour is constantly condensed ; whence, on a vacuum being thus formed, and the weight of the atmosphere acting on the surface of the piston, attached to the arm of the balance, it is made to descend, and to raise the other arm that is fixed to the pump ; while this being somewhat heavier, immediately sinks again, which carries up the piston, while the cylinder is again filled : and thus alternately by cooling and filling it, is the machine kept in motion ; the power exerted in raising the pump-arm being always in proportion to the diameter of the cylinder, or to the surface of the piston, which is exactly fitted to it, and on which the pressure acts.

The contrivance too, of having the under part of the alembick, where the condensed vapour is collected, or upper part of what they call the *adhur*, of earthen-ware, of so great a thickness, and of course at so great a distance from the heat in the body of the still, is well imagined to keep the spirits the coolest possible, when collected and running off.

By thus cooling and condensing the vapour, likewise, so suddenly as it rises, there is in a great measure a constant vacuum made, or as much as possible can be; but that both steam rises faster, and that water boils with much less heat, when the pressure is taken away from its surface, is an axiom in chymistry too well known to need any illustration; it boiling in vacuum, when the heat is only ninety or ninety-five by Fahrenheit's Thermometer, whereas in the open air, under the pressure of the atmosphere, it requires no less than that of two hundred and twelve ere it can be brought to the boiling point.

I must further observe, that the superior excellence of condensing the vapour so effectually and speedily in the alembick to our method of doing it on a worm and cooler, is greatly on the side of the former; both from the reasons I have already adduced, and because of the small stream of vapour that can be only forced into the worm, where it is condensed gradually as it descends; but above all, from the nature of vapour itself, with respect to the heat contained in it, which of late has been proved, by the very ingenious Dr. BLACK, to be greater by far than, before his discoveries, was imagined. For vapour he has shown to be in the state of a new fluid, where water is dissolved by heat; with the assistance, perhaps, if I may be allowed a conjecture, of the air which it contains: and all fluids, as he has clearly demonstrated, on their becoming such, absorb  
a certain

a certain quantity of heat, which becomes what he very properly calls latent heat, it being heat not appearing either to the senses or to the thermometer while they remain in that liquid state; but showing itself immediately by its effects on whatever is near it, upon their changing their form from fluid to solid; as on water becoming ice, or metals fixing and the like. In the solution of salts, also there is an absorption of heat, as we daily experience in the cooling of our liquors by dissolving salt-petre in water; and this he has found to be the case with water itself, and other fluids, when passing into a state of vapour by boiling. From the most accurate and judicious experiments, indeed, he infers, and with the greatest appearance of truth, that the heat thus concealed in vapour raised by boiling, from any given bulk of water, would be fully sufficient, if collected in a piece of iron of the like size, to make it perfectly red hot. What then must be the effect of so much heat, communicated in our way of distilling to the worm, and to the water in the tub, will be sufficiently evident from what has been said, to prove, I think, that we have hitherto employed a worse and more defective method than we might have done with respect to cooling at least, both in the making of spirits, and in other distillations of the like kind, where a similar mode is adopted.

The poor ignorant *Indian*, indeed, while he with wonder surveys the vast apparatus of *European* distillers, in their immense large stills, worms, tubs, and expensive furnaces, and finds that spirits thus made by them are more valued, and sell much dearer than his own, may very naturally conclude, and will have his competitors join with him in opinion, that this must alone surely be owing to their better and more judicious manner of distilling with all those ingenious and expensive contrivances,



which he can no wife emulate ; but in this, it would appear, they are both equally mistaken ; imputing the effects, which need not be controverted, perhaps, to a cause from which they by no means proceed ; the superiority of their spirits, not at all arising from the superior excellence of these stills and furnaces, nor from their better mode of conducting the distillation in any respect ; but chiefly rather from their greater skill and care in the right choice, and proper management, of the materials they employ in fermentation ; and above all, as I apprehend, from the vast convenience they have in casks, by which, and from their abilities in point of stock, they are enabled, and do, in fact, in general, keep their spirits for a certain time, whence they are mellowed, and improved surprizingly both in taste and salubrity.

With respect to the latter improvement, I mention it more particularly here ; and the more willingly also, as in general it seems to have been but too little attended to where a due attention to it might be of the greatest use. For of all things that have been found grateful to the human palate, there was none ever used, I believe, more hurtful to the body, and to the nerves especially, than fresh drawn ardent spirits ; and this owing evidently to the principle of inflammability, of which, with water, they are mostly made up, being then in a more loose and detached state, less assimilated with the other principles than it afterwards becomes with time. By time, indeed, it is gradually not only more assimilated, but at length changes its nature altogether ; so as to become, what was at first so pernicious, a benign, cooling liquor : when the spirit is strong, the change, it is true, goes on more slow and imperceptibly ; yet as a partial alteration is only wanted to mellow it for use, a few years keeping would be sufficient to answer the purpose here : and whether or no it could be possible

possible to prevent any other from being sold than that which had been kept a certain time, is well worth the consideration of the Legislature.

That the great noxious quality of fresh drawn spirits is chiefly owing to the cause I have assigned, a little attention, and comparing of the effects that are uniformly produced by the principle of inflammability, wherever it is met with in a loose and weakly combined state, as it is in them, will easily convince us of: whereas, when fully assimilated either in spirits, or with any other body, it becomes entirely inert, and useful, more or less, either for food or physick, according to what it happens to be united with. Thus we find it in putrid animal substances, where it lately formed part of a healthy body, being now detached, or but weakly united with air, exhibiting a most offensive and pernicious poison: though this absorbed again by a living plant, is presently changed into good and wholesome nourishment; to the vegetable immediately, and to any animal who may afterwards choose to eat it. In like manner sulphur, which is a compound of this principle alone, united to a pure acid, the most destructive to all animal and vegetable substances, yet, it being here perfectly inert also, may be taken into the body with safety; when, if loosened either by heat or by an alkaline salt uniting with the acid, its noxious quality is presently made perceivable to whoever comes within its reach.

Many other instances of a like nature might easily be added, and some too more apposite, perhaps, than those I have here mentioned; but every one's own experience, with what I have already said, will sufficiently evince the propriety and utility of putting an entire stop, if possible, to the sale of what ought to be so justly prohibited; and this,  
in

in its consequences, may even help to lead to other more effectual means of correcting, in a great measure, the cruel abuse of spirits in general, that has been long so loudly and so justly complained of, amongst the soldiers, lower *Europeans*, and our servants in this country; where the very worst, and, indeed, poisonous sort of them, is daily sold at so very cheap a rate.

All I need further add with respect to distillation, and on the superior advantages in the mode of conducting it here, to that we have been in use to employ for the raising of spirits, simple waters, and the like, is only to observe, I have no sort of doubt but that the intelligent chymical operators at home, if ever they should get a hint of it, will make no manner of scruple to use it also, and to improve upon it greatly by a few ingenious contrivances, which their knowledge and experience will so easily suggest. The principles on which it seems founded, indeed, especially with regard to their way of cooling, are so striking and just, that in many other distillations besides those of spirits and waters, they may be employed, I apprehend, with very great profit and advantage. I shall now, however, confine myself to mention only the benefit that may result from a like process in the raising of the finer aromatics, while the heat contrived, as in our way, besides impeding the distillation, must, from its long action on such subtle bodies, probably injure them greatly in the essential quality on which their excellence depends; and upon this very account I am apt to imagine that the greater quantity obtained, and the superior quality of the *Oil of Roses* made in this country, to that made from *roses* with us, is owing chiefly, if not entirely, to their better and more judicious manner of extracting it here. For, with us, the still being made of metal, may, in the first instance, impart too great  
and

and too sudden a degree of heat; and next, the *oil* continuing so long in the vapour, and that much compressed, may, in so delicate a subject, not only entirely almost unite it with the water, so as to render the separation impracticable, but may at the same time alter its essence so completely, as that it can no longer appear in the state it otherwise might have been found in, had the operation been better conducted, or in the way they do here. A very few trials, however, would much better certify this than all I can possibly say on the subject, or, in fact, than all the reasoning in the world. . Therefore, as to my own particular opinion of the flavour and quality of the *roses* at home being equal, if not superior, to that of those in this country, I may be entirely silent. The rules and reasoning in chymistry, though serving greatly to enlarge and improve our understanding, being what of themselves can never be depended upon till confirmed by facts and experiments; where many things often turn out very different from what, from our best and most plausible arguments, we had the greatest reason to expect. Or, if it should be found to be really true, what I have often heard asserted, by those, however, who had it only from others, but not of their own particular knowledge, that, in distilling their *Oil of Roses* at the places where they make it the best, they use also, with their *roses*, *sandal-wood*, and some other aromatics, no *roses* whatsoever, it is plain, could ever of themselves be made to afford a like *oil*, nor without such an addition as they employ. A circumstance, by the bye, that might possibly easily be certified by some one of the many ingenious correspondents of the Society, who may happen to reside where it is made: and a knowledge of the real truth of it would certainly be of use.

*Chatra, December 24, 1786.*

A METHOD

## XVI.

A METHOD OF CALCULATING THE MOON'S PARALLAXES  
IN LATITUDE AND LONGITUDE.

By MR. REUBEN BURROW.

**I**N the Nautical Almanack for 1781, among other problems published by authority of the Board of Longitude, there is one for calculating the place of the Nonagesimal Degree; which is expressly recommended to Astronomers as "superior to all other methods for calculating eclipses of the Sun and occultations of the Stars." Now, as a considerable part of that method is erroneous, and particularly in south latitudes, and between the Tropics, (which include the most of *India*,) the error may therefore be of consequence; and the more so, as it is published under the sanction of Dr. MASKELYNE, the Astronomer Royal. I have, therefore, taken the liberty of giving the following rule to supply its place; and, in imitation of the methods of the *Hindoos*, have endeavoured to express it so plainly, that any person may calculate by it without knowing much of the subject.

## P R O B L E M.

Given the apparent time at any given place; to find the longitude and altitude of the nonagesimal degree, and also the parallaxes in latitude and longitude.

1. Turn the difference of longitude from *Greenwich* into time, and add it to the apparent time, if the place be to the west of *Greenwich*; but  
subtra&

subtract if the place be to the east, and the sum, or remainder, will be the apparent time at *Greenwich*.

2. To this time calculate the sun's right ascension in time, and add it to the apparent time at the given place; the sum is the right ascension of the meridian in time.

3. From the latitude of the place by observation, subtract the correction taken from page LXXV of MAYER's Tables; the remainder is the latitude in the spheroid.

4. Call the right ascension of the meridian in degrees AR; and, if the right ascension of the meridian

$$\text{Be between } \left\{ \begin{array}{l} 00 \text{ and } 90 \\ 90 \text{ and } 270 \\ 270 \text{ and } 360 \end{array} \right\} \text{ then, in } \left\{ \begin{array}{l} \text{North} \\ \text{Latitude.} \end{array} \right. \left\{ \begin{array}{l} \text{AR} + 90 \\ 270 - \text{AR} \\ \text{AR} - 270 \end{array} \right\} \text{ is an Arc A. } \left\{ \begin{array}{l} \text{but in} \\ \text{South} \\ \text{Latitude.} \end{array} \right. \left\{ \begin{array}{l} 90 - \text{AR} \\ \text{AR} - 90 \\ 450 - \text{AR} \end{array} \right\} \text{ is the Arc A.}$$

5. Let half the sum of the colatitude of the place and the obliquity of the ecliptic be called C; and half their difference D; then add the secant of C, the cosine of D, and the cotangent of half A, together: the sum (rejecting twice radius) is the tangent of an arc M; then add the cosecant of C, the sine of D, and the cotangent of half A, together; the sum (rejecting twice radius) is the tangent of an arc N: then if the colatitude of the place be greater than the obliquity of the ecliptic, the sum of M and N is an angle, whose complement call B; but, if the colatitude be less than the obliquity, let the complement of the difference of M and N be called B.

6. Add the secant of B, the fine of A, and the cofine of the latitude of the place, together; the sum (rejecting twice radius) is the fine of the altitude of the nonagesimal degree.

7. Add the tangent of the latitude to the tangent of the obliquity of the ecliptic; the sum is the fine of an angle, which call X.

8. When the right ascension of the meridian is

$$\text{Between } \left\{ \begin{array}{l} 360^\circ - X \text{ and } 90^\circ \\ 90^\circ \text{ and } 180^\circ + X \\ 180^\circ + X \text{ and } 270^\circ \\ 270^\circ \text{ and } 360^\circ - X \end{array} \right\} \begin{array}{l} \text{in} \\ \\ \text{N.} \\ \text{Lat.} \end{array} \left\{ \begin{array}{l} \text{between} \\ \\ \text{S.} \\ \text{Lat.} \end{array} \right\} \left\{ \begin{array}{l} X \text{ and } 90^\circ \\ 90^\circ \text{ and } 180^\circ - X \\ 180^\circ - X \text{ and } 270^\circ \\ 270^\circ \text{ and } X \end{array} \right\} \begin{array}{l} \text{in} \\ \\ \text{S.} \\ \text{Lat.} \end{array} \left\{ \begin{array}{l} B \\ 180^\circ - B \\ 180^\circ + B \\ 360^\circ - B \end{array} \right\} \text{then } \left\{ \begin{array}{l} B \\ 180^\circ - B \\ 180^\circ + B \\ 360^\circ - B \end{array} \right\} \text{ is the } \begin{array}{l} \\ \\ \text{Longi-} \\ \text{tude} \end{array}$$

of the nonagesimal degree.

9. Add the moon's latitude to  $90^\circ$  when it is of a contrary name to the latitude of the place; but subtract it from  $90^\circ$  when it is of the same name; the sum or remainder, is the moon's polar distance: also take the difference between the moon's longitude and the longitude of the nonagesimal degree; which difference call P: also let half the sum of the moon's polar distance and altitude of the nonagesimal degree be called Q; and half their difference, R.

10. Add the secant of Q, the cofine of R, and the cotangent of half P, together; the sum is the tangent of an arc  $m$ : also add the cofecant of Q, the fine of R, and the cotangent of half P, together; the sum is the tangent of an arc  $n$ .

11. If the altitude of the nonagesimal degree be greater than the  
moon's

moon's polar distance, take the sum of the arcs  $m$  and  $n$  for the parallactic angle; but if it be less, take their difference.

12. Add the cosecant of the parallactic angle, the sine of  $P$ , and the sine of the altitude of the nonagesimal degree, together; the sum (rejecting twice radius) is the sine of the moon's true zenith distance.

13. To the sine of the moon's true zenith distance add the logarithm of the horizontal parallax; the sum (rejecting radius) is the logarithm of the parallax in altitude nearly; add the parallax, thus found, to the true zenith distance, and the sum will be the corrected zenith distance.

14. Add the sine of the corrected zenith distance, the cosine of the parallactic angle, and the logarithm of the horizontal parallax, together; the sum (rejecting twice radius) is the logarithm of the parallax in latitude.

15. Add the logarithm of the parallax in latitude, the tangent of the parallactic angle, and the secant of the moon's latitude, together; the sum (rejecting twice radius) is the logarithm of the parallax in longitude.

### E X A M P L E.

"What is the altitude and longitude of the nonagesimal degree at *Ludlow*, whose lat. is  $52^{\circ} 23'$  north, and longitude  $0^{\text{h.}} 11^{\text{m.}}$  west of *Greenwich*, 7th February, 1778, at 10 h.  $56' 11''$  app. time, being the time of an occultation of  $\mu$  geminorum."



Not having the Almanack for 1778, I shall assume the moon's latitude to be  $0^{\circ} 51' S.$  and her longitude  $91^{\circ} 57'.$

$$\begin{array}{r} h. \quad ' \quad '' \\ 10 \quad 56 \quad 11 \text{ ap. time} \\ 0 \quad 11 \quad 0 \text{ diff. long.} \end{array}$$

$$\begin{array}{r} 11 \quad 7 \quad 11 \text{ ap. t. Greenwich} \end{array}$$

$$\begin{array}{r} 52 \quad 23 \text{ latitude.} \\ 0 \quad 14 \text{ correction.} \end{array}$$

$$\begin{array}{r} 52 \quad 9 \text{ reduced lat.} \\ 37 \quad 51 \text{ colat.} \end{array}$$

$$\begin{array}{r} 18 \quad 55 \text{ half colat.} \\ 11 \quad 44 \text{ half obliq.} \end{array}$$

C = 30 39	fecant	10.06535	cofecant	10.29261
D = 7 11	cofine	9.99658	fine	9.09706
$\frac{1}{2}$ A = 72 4	cotan.	9.51005	cotan.	9.51005
M = 20 28	tan. M.	9.57198	tan. N.	8.89972
N = 4 32				

$$\begin{array}{r} 25 \quad 0 \\ B = 65 \quad 0 \\ 180 \quad 0 \end{array}$$

$$\begin{array}{r} A = 144. \quad 9 \text{ fin. } 9.76765 \\ \text{Lat. } 52. \quad 9 \text{ cof. } 9.78788 \\ B \quad 65 \quad 0 \text{ sec. } 10.37405 \end{array}$$

$$115 \quad 0 \text{ long. nonagefinal degree.}$$

$$\text{Altitude of do. } 58 \quad 15 \quad S. \quad 9.92958$$

$$\begin{array}{r} \text{half p's polar dist.} = 45 \quad 26 \\ \text{half alt. non. deg.} = 29 \quad 8 \end{array}$$

Q = 74 34	fecant	10.57493	cofecant	10.01595
R = 16 18	cofine	9.98218	fine	9.44819
$\frac{1}{2}$ P = 11 32	cotan.	10.69025	cotan.	10.69025
m = 86 46	tan m	11.24756	tan n	10.15439
n = 54 58				

parallactic

parallaſtic angle	=31 48	coſecant	10.27823
alt non. degree	58 15	- fine	9.92958
	P=23 3	- fine	9.59277
<hr/>			
moon's true zen. d.	39 11	- fine	9.80058
horizon. parallax	3488	- log.	3.54258
<hr/>			
par. in alt. nearly	2204	- log.	3.34316
<hr/>			
corrected zen. diſt.	39 47 44	fine	9.80628
hor. par.		log.	3.54258
parallaſtic angle		cofine	9.92936
<hr/>			
parallax in latitude	=1898	- log.	3.27822
parallaſtic angle	-	tangent	9 79241
moon's latitude	0 51	- ſecant	10.00023
<hr/>			
parallax in long.	1177	- log.	3.07086

When the moon is very near the ecliptic, as in eclipses, the following method will be nearly exact.

1. Add the cofine of the altitude of the nonageſimal degree to the logarithm of the horizontal parallax; the ſum (rejecting radius) is the logarithm of the parallax of latitude nearly: Add this parallax to the complement of the altitude of the nonageſimal degree, and call the ſum the complement of the altitude of the nonageſimal degree corrected.

2. Add the coſecant of the complement of the altitude of the nonageſimal degree; the fine of the complement of the altitude of the nonageſimal

final degree corrected, and the logarithm of the parallax of latitude nearly, together; the sum (rejecting twice radius) is the logarithm of the parallax in latitude corrected.

3. Add the logarithm of the parallax in latitude corrected; the sine of P, and the tangent of the altitude of the nonagesimal degree, together; the sum (rejecting twice radius) is the logarithm of the parallax in longitude.

SCHOLIUM. The method of applying the parallaxes usually given requires no other correction than the following. When the pole of the ecliptic of the same name as the latitude is under the horizon, to the cotangent of the altitude of the nonagesimal degree add the cotangent of the moon's latitude; the sum is the cosine of an angle; which added to, and subtracted from, the longitude of nonagesimal degree, gives two longitudes, between which the moon's latitude of a contrary name to the elevated pole is to be increased for the apparent latitude; but beyond those longitudes the moon's true latitude is to be increased by the parallax in latitude to have the apparent latitude.

## REMARKS ON THE ARTIFICIAL HORIZONS, &amp;c.

*By Mr. REUBEN BURROW.*

THE utility of a perfect horizon, and the liableness of quicksilver to be disturbed by the least wind, have induced numbers of people to invent artificial horizons of different kinds, and many of them very complicated. Some time ago, having occasion to determine the situation of several places by astronomical observations, and there being no astronomical quadrant belonging to the company in the settlement, I was under a necessity of determining the latitudes by a sextant; and that at a time when the sun passed so near the zenith as to make it impossible to get meridian altitudes: I therefore collected all the different artificial horizons and glass roofs, and other contrivances, for that purpose I could meet with; but, though they appeared correct, the results were very erroneous. I examined them by bringing the two limbs of the sun, seen by direct vision, to touch apparently in the telescope of a sextant, and then observed the reflected images in quicksilver, which still appeared to touch as before; but, on examining the reflected images in the rest of the artificial horizons, none of them appeared to touch; and the error in many was very considerable. I tried a number of other methods with little success, as they were mostly combinations of glasses. At last, accidentally hearing some officers speaking of "Tents that would neither turn sun nor rain," I considered that the rays of the sun would pass through cloth unrefracted, and in consequence

consequence of this idea I applied some thin mosquito\* curtain as a covering to the quicksilver, and found it effectually excluded the wind and admitted the sun; and what is of equal consequence in this country, it totally kept away those minute insects that disturb the surface of the quicksilver in observing; in short, it formed so complete a horizon, that I could not before have hoped for any thing so perfect; and it is equally applicable to the sun and stars.

For taking very great or very small elevations of the sun, (which with the common horizon sextants are impracticable in the direct method,) a polished metalline instrument might be made in the form of part of a hollow obtuse cone: this might have its axis set perpendicular to the horizon at any time *by means of screws* in a variety of methods; and observations might be made by it with great exactness.

In finding the latitude, when meridian observations cannot be taken, either there is an opportunity of taking altitudes on both sides of the meridian, or not: when there is not, the best method is to calculate the latitude from two altitudes and the time between, exactly by spherical trigonometry, (first correcting the declination to the beginning and end of each interval) as the approximating methods of DOWES, and others, are totally insufficient. When observations can be taken both before and after noon, it is best to take a number of altitudes in both, and then make out the equal altitudes by proportion; then having found the true time of noon by the usual method, correct the two intervals and the declination to each time, and the latitude may be found as follows.

\* A kind of silk gauze, as close as book-mullin, and perfectly transparent. It is to be stretched over a hoop, which stands without touching the vessel containing the mercury.

*Add the cosine of the angle from noon, to the cotangent of the declination; the sum is the cotangent of an arch  $A$ .*

*Add the sine of  $A$ , the sine of the altitude, and the arithmetical complement of the sine of the declination, together; the sum is the cosine of an arch  $B$ .*

*Then the sum or difference of  $A$  and  $B$  is the latitude.*

As every single altitude gives an independent latitude, it is evident the latitude may be thus found to great exactness.

An instrument might easily be contrived to measure the sun's angle of position to great exactness, from whence the latitude might readily be deduced; a small addition to the common theodolite would be sufficient. The variation of the azimuth near the meridian may also be advantageously applied for the same purpose.

*DEMONSTRATION of a THEOREM concerning the INTERSECTIONS of CURVES.*—By REUBEN BURROW, Esq.

IN STONE'S Mathematical Dictionary is the following paragraph: "Two  
 " geometrical lines of any order will cut one another in as many points  
 " as the number expresses, which is produced by the multiplication of the  
 " two numbers expressing those orders:" And Mr. BRAIKONRIDGE, in  
 " the preface to his *Exercitatio Geometrica de descriptione Curvarum*, says,  
 " Mr. GEORGE CAMPBELL, now Clerk of the Stores at *Woolwich*, has got  
 " a neat demonstration of the same, which I hope he will publish." As it  
 does not appear that CAMPBELL ever published any thing, except a paper  
 on the roots of equations, and a small treatise on the plagiarisms of  
 MACLAURIN, it is very probable his demonstration is lost, and therefore it  
 may not be improper to publish the following.

The equation of a line of the first order has one root, or function of  
 the absciss, for the ordinate; of the second order, two; and so on.

In equations for two right lines, the roots may so vary and accommodate  
 themselves to each other, that the quantities expressing the ordinates may be  
 equal; and as there is only one case where this can happen, therefore two  
 right lines can only intersect in one point.

If a line of the first order be compared with a line of the second, or  
 an equation of one root with an equation of two; the root of the first,  
 and a single root of the second, may so vary as to become equal to each  
 other, or to form an intersection. By the same reason, the single root of  
 the

the first, and the remaining root of the second, may each so vary as to become equal, or to form another intersection; and therefore a right line cuts a line of the second order in two points.

If a line of the first order be compared with a line of the  $n$  order, it is also evident that the single root of the first line may in the same manner be so varied with each of the  $n$  roots of the second line as to become equal; and therefore a right line may cut a line of the  $n$  order in  $n$  points.

Let a line of the  $m$  order be now compared with a line of the order  $n$ ; then as each single root of the first line may become equal, in the same manner, to every root in the second, it therefore follows, that for every unit in  $m$  there may be  $n$  intersections; and as there are  $m$  units, there consequently will be  $mn$  intersections.

The same method may be applied to the determination of the points, line, and surfaces, that arise from the intersections of lines, surfaces, and solids; by considering that the number of times that  $p$  may be taken from  $m$ , and  $q$  at the same time from  $n$ , will be  $\frac{m \cdot m - 1 \dots p, \times n \cdot n - 1 \dots q}{1 \cdot 2 \cdot 3 \dots p, \times 1 \cdot 2 \cdot 3 \dots q}$



## XVII.

THE PROCESS OF MAKING ATTAR,  
OR ESSENTIAL OIL OF ROSES.

BY LIEUTENANT COLONEL POLIER.

THE *attar* is obtained from the roses by simple distillation, and the following is the mode in which I have made it. A quantity of fresh roses (for example, forty pounds) are put in a still with sixty pounds of water, the roses being left as they are with their calyxes, but with the stems cut close. The mass is then well mixed together with the hands, and a gentle fire is made under the still. When the water begins to grow hot, and fumes to rise, the cap of the still is put on, and the pipe fixed: the chinks are then well luted with paste, and cold water put on the refrigerator at top. The receiver is also adapted at the end of the pipe; and the fire is continued under the still, neither too violent nor too weak. When the impregnated water begins to come over, and the still is very hot, the fire is lessened by gentle degrees, and the distillation continued till thirty pounds of water are come over, which is generally done in about four or five hours. This rose-water is to be poured again on a fresh quantity (forty pounds) of roses, and from fifteen to twenty pounds of water are to be drawn by distillation, following the same process as before. The rose-water thus made and cohobated, will be found, if the roses were good and fresh, and the distillation carefully performed, highly scented with the roses. It is then poured into pans either of earthen-ware or of tinned metal, and left exposed to the fresh air for the night. The *attar* or

\* essence

*essence* will be found in the morning congealed, and swimming on the top of the water. This is to be carefully separated, and collected, either with a thin shell or a skimmer, and poured into a vial. When a certain quantity has thus been obtained, the water and feces must be separated from the clear *essence*, which, with respect to the first, will not be difficult to do, as the *essence* congeals with a slight cold, and the water may then be made to run off. If, after that, the *essence* is kept fluid by heat, the feces will subside, and may be separated; but, if the operation has been neatly performed, these will be little or none. The feces are as highly perfumed as the *essence*, and must be kept after as much of the *essence* has been skimmed from the rose-water as could be. The remaining water should be used for fresh distillations, instead of common water; at least as far as it will go.

The above is the whole process of making genuine *attar* of roses. But, as the roses of this country give but a very small quantity of *essence*, and it is in high esteem, various ways have been thought of to augment the quantity, though at the expence of the quality. In this country it is usual to add to the roses, when put in the still, a quantity of sandal-wood raspings, some more, some less, (from one to five *tolahs*, or half ounces.) The sandal contains a deal of essential oil, which comes over freely in the common distillation, and mixing with the rose-water and *essence*, becomes strongly impregnated with their perfume. The imposition, however, cannot be concealed; the essential oil of sandal will not congeal in common cold; and its smell cannot be kept under, but will be apparent and predominate, in spite of every art. In *Cashemire* they seldom use sandal to adulterate the *attar*, but I have been informed, to encrease the quantity, they distill with the roses a sweet-scented graft, which does not communicate any unpleasant

fant scent, and gives the *attar* a high clear green colour. This essence also does not congeal in a slight cold as that of roses.

Many other ways of adulteration have been practised, but all so gross and palpable that I shall say nothing of them.

The quantity of essential oil to be obtained from the roses, is very precarious and uncertain, as it depends not only on the skill of the distiller, but also on the quality of the roses, and the favourableness of the season. Even in Europe, where the chemists are so perfect in their business, some, as TACHENIUS, obtained only half an ounce of oil from one hundred pounds of roses. HAMBERG obtained one ounce from the same quantity; and HOFFMAN above two ounces. (N. B. the roses in those instances were stripped of their calyxes, and only the leaves used.) In this country nothing like either can be had; and to obtain four *mashas* (about one drachm and a half) from eighty pounds, which deducting the calyxes, comes to something less than three drachms per hundred pounds of rose-leaves, the season must be very favourable, and the operation carefully performed.

In the present year, 1787, I had only sixteen *tolahs* of *attar* from fifty-four *maunds*, twenty-three *seers*, of roses, produced from a field of thirty-three *biggahs*, or eleven *English* acres; which comes to about two drachms per hundred pounds. The colour of the *attar* of roses is no criterion of its goodness, quality, or country. I have had, this year, *attar* of a fine emerald green, of a bright yellow, and of a reddish hue, from the same ground, and obtained by the same process, only of roses collected at different days.

The calyxes do not in any shape diminish the quality of the *attar*, nor impart any green colour to it ; though, perhaps they may augment the quantity : but the trouble necessary to strip them must, and ought to, prevent its being ever put in practice.

*Lucknow, May, 1787.*

By Mr. MACDONALD, with a Specimen of GOLD.

THE country of *Limong*,\* on the Island of *Sumatra*, immediately contiguous to the presidency of *Fort Marlborough*, and between twenty and eighty miles inland, produces the finest gold and gold-dust on that island. The *Limong* gold merchants repair annually to *Marlborough*, for the purchase of *opium*, and such other articles as they may be in want of; in exchange for which they give gold of so pure a nature as to contain little or no alloy. The gold is found sometimes in dust, and often lodged in a very hard stone. It is of a whitish colour, and resembles that in which the veins run in the gold mines of *Tiltit* in *Chili*. The gold is extracted by beating the compound mass in order to disengage it from the stone, which flies off in splinters, and leaves the gold cleared of it. This is the mode used by a rude people; by which a part of the gold must be lost in the splinters of the stone, which fly off in beating the mass. They are totally ignorant of the advantage of grinding it to a gross powder, mixing it with quicksilver, and separating the earthen and stony particles from those of the gold, by the action of a stream of water on this paste, carrying off the former, and leaving the latter precipitated to the bottom by their greater weight. They are almost entirely ignorant of the principles of assaying and amalgamation, but are extremely expert in separating particles of foreign metals from gold-dust, by a very superior acuteness of vision, no doubt arising from experience, and not a peculiar gift. They have people among them who are gold-cleaners by occupation. The gold is found in a species of earth composed of a clayish-red loam. On digging the earth, it is found to consist of strata (under the loam of the surface, commonly called soil) of irregular-shaped stones

of

of a mouldering nature, mixed with a red clay, and hard pebbles mixed with a pale red clay, of a more dense consistency than that of the first stratum. The first stratum extends to a depth of three feet and a half, and the second to somewhat less. The consistency under these strata is formed of either hard rock, or of gravel nearly approaching to it. The gold is found mixed with a stone of a hard nature, and capable of sustaining a polish. It is found near the surface, and generally in a soil free from solid rock.

The merchants, who bring the gold for sale, are not themselves the finders or gatherers of it, but receive it, for merchandize, from the *Malays* inhabiting the interior part of the country. The native indolence of the *Malay* disposition prevents them from collecting more than is sufficient to supply the few and simple wants of a race of men, as yet, unenlightened by civilization and science, and ignorant of the full extent of the advantages of the country inhabited by them. We have not, to this hour, explored a country, which, we have reason to suppose, produces more, or as much gold as either *Peru* or *Mexico*. This may be attributed partly to the difficulties incident to the undertaking, and partly to a want of curiosity, that, indulged, might have been productive of great national and private advantages. The roads leading to this golden country are almost impervious; affording only a scanty path to a single traveller, where whole nights must be passed in the open air, exposed to the malignant influence of a hostile climate, in a country infested by the most ferocious wild beasts. These are circumstances that have hitherto checked curiosity; but perseverance and contrived precaution will surmount the obstacles they furnish, and such discoveries might be made, as would amply compensate for the difficulties leading to them. The gold-  
 Vol. I. X x merchants

merchants who come from the neighbouring and less rich countries, give us such accounts of the facility of procuring gold as border nearly on the marvellous, and would be altogether incredible, if great quantities of that metal produced by them did not, in a great measure, evince the certainty of their accounts. I have seen an imperfect chart of a part of the interior country, made by an intelligent native, on the scale of the rate of his walking, and from the respective situations of the sun in regard to his position. It contained a chain of what he called Gold Mines, extending in latitude, nearly, not much less than three degrees. This chart is in the possession of Mr. MILLER of the council of *Fort Marlborough*, who did me the favour of explaining it. After making allowances for the licence of a traveller, some credit may be given to this chart, more especially, as we are well assured that that part of *Sumatra* produces large quantities of fine gold. The result of the whole is, that it would be a very laudable object to explore those rich countries, and to establish the working of gold-mines in them, as it could be done under a certain prospect of advantage. The expence arising from clearing the country, procuring intelligence, making roads, establishing and forming posts of communication, and of employing professional men, would, undoubtedly, be at first very considerable, but the resulting advantages would defray these, and render it a matter of surprise, that a measure attended with such obvious utility had not been adopted at an earlier period.

It is more than probable, that *Sumatra* must have been the *Ophir* of SOLOMON'S time. This conjecture derives no small force from the word *ophir's* being really a *Malay* substantive of a compound sense, signifying a mountain containing gold. The natives have no oral or written tradition on the subject, excepting, that the island has in former times afforded gold for exportation: whether to the eastward or westward, remains an uncertainty. We have

have certain accounts that the vessels that imported this article were long detained, or did not return in much less than a year. It is therefore probable that they wintered, during the violence of the SW. monsoon, either at *Ceylon*, or on the NE. coast, and completed their voyages during the moderate part of the other monsoon.



## XVIII.

ON THE LITERATURE OF THE HINDUS,  
FROM THE SANSKRIT,

COMMUNICATED BY GOVERDHAN CAUL,

*With a short Commentary.*

## THE TEXT.

THERE are eighteen *Vidyâ's*, or parts of *true knowledge*, and some branches of knowledge *falsely so called*; of both which a short account shall here be exhibited.

The first *four* are the immortal *Vêda's*, evidently revealed by God; which are entitled, in one compound word, *Rigyajushsâmât'harva*, or in separate words, *Rich*, *Yajush*, *Sâman*, and *At'harvan*. The *Rigvêda* consists of *five* sections; the *Yajurvêda*, of *eighty-six*; the *Sânavêda*, of *a thousand*; and the *At'harvavêda*, of *nine*; with eleven hundred *śâc'ha's*, or branches, in various divisions and subdivisions. The *Vêda's* in truth are infinite; but were reduced by VYĀSA to this number and order: the principal part of them is that which explains the duties of man in a methodical arrangement; and in the *fourth* is a system of divine ordinances.

From these are deduced the four *Upavêdas*, namely, *Ayush*, *Gândharva*, *Dhanush*, and *S'hâpatya*; the first of which, or *Ayurvêda*, was delivered to mankind by BRAHMA', INDRA, DHANWANTARI, and *five* other deities; and comprizes the theory of disorders and medicines, with the practical methods of curing diseases. The second, or *musick*, was invented and explained by BHARATA: it is chiefly useful in raising the mind by devotion

to

to the felicity of the Divine Nature. The third *Upavéda* was composed by VISWAMITRA on the fabrication and use of arms and implements handled in war by the tribe of *Cshatriya's*. VIS'WACARMAN revealed the *fourth* in various treatises on *sixty-four* mechanical arts, for the improvement of such as exercise them.

Six *Anga's*, or *bodies of learning*, are also derived from the same source: their names are *Sicshà*, *Calpa*, *Vyácarana*, *Ch'handa's*, *Jyótish*, and *Niructi*. The *first* was written by PA'NINI, an inspired saint, on the *pronunciation* of vocal sounds: the *second* contains a detail of religious acts and ceremonies from the first to the last; and from the branches of these works a variety of rules have been framed by A's'WALA'YANA, and others. The *third*, or the grammar, entitled *Páhiníya*, consisting of *eight* lectures or chapters, (*Vridhdhirádaij*, and so forth,) was the production of three *Rishi's*, or holy men, and teaches the proper discriminations of words in construction; but other less abstruse grammars, compiled merely for popular use, are not considered as *Anga's*. The *fourth*, or *prosody*, was taught by a *Muni*, named PINGALA, and treats of charms and incantations, in verses aptly framed and variously measured; such as the *Gáyatri*, and a thousand others. *Astronomy* is the *fifth* of the *Védanga's*, as it was delivered by SU'RYA, and other divine persons: it is necessary in calculations of time. The *sixth*, or *Niructi*, was composed by YA'SCA (so is the manuscript; but, perhaps, it should be VYA'SA) on the signification of difficult words and phrases in the *Véda's*.

Lastly, there are four *Upánga's*, called *Purána*, *Njáya*, *Mimánsà*, and *Dherma śástra*. Eighteen *Purána's*, that of BRAHMA, and the rest, were composed by VYA'SA for the instruction and entertainment of mankind in general.

general. *Nyāya* is derived from the root *ní*, to acquire or apprehend; and, in this sense, the books on apprehension, reasoning, and judgment, are called *Nyāya*. The principal of these are the work of GAUTAMA, in five chapters, and that of CANA'DA, in ten; both teaching the meaning of sacred texts, the difference between just and unjust, right and wrong, and the principles of knowledge, all arranged under twenty-three heads. *Mīmāṃsā* is also twofold; both showing what acts are pure or impure, what objects are to be desired or avoided, and by what means the soul may ascend to the First Principle. The former, or *Carma Mīmāṃsā*, comprized in twelve chapters, was written by JAIMINI, and discusses questions of moral duties and law. Next follows the *Upāsanā Cānda* in four lectures, (*Saṅcarshana* and the rest,) containing a survey of Religious Duties; to which part belong the rules of SA'NDILYA, and others, on devotion and duty to GOD. Such are the contents of the *Pūrva*, or former, *Mīmāṃsā*. The *Uttara*, or latter, abounding in questions on the Divine Nature and other sublime speculations, was composed by VYA'SA, in four chapters and sixteen sections: it may be considered as the brain and spring of all the *Anga's*; it exposes the heretical opinions of RA'MA'NUJA, MA'DHWA, VALLABHA, and other sophists; and, in a manner suited to the comprehension of adepts, it treats on the true nature of GANE'SA, BHA'SCARA, or the Sun, NI'LACANTA, LACSHMI', and other forms of One Divine Being. A similar work was written by S'RI' S'ANCARA, demonstrating the supreme power, goodness, and eternity of GOD.

The Body of Law, called *Smṛiti*, consists of eighteen books, each divided under three general heads, the duties of religion, the administration of justice, and the punishment or expiation of crimes. They were delivered, for  
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the instruction of the human species, by MENU, and other sacred personages.

As to *ethicks*, the *Véda's* contain all that relates to the duties of kings; the *Purána's*, what belongs to the relation of husband and wife; and the duties of friendship and society (which complete the triple division) are taught succinctly in both: this double division of *Anga's* and *Upánga's* may be considered as denoting the double benefit arising from them in *theory* and *practice*.

The *Bhárata* and *Rámáyana*, which are both *epick poems*, comprize the most valuable part of ancient history.

For the information of the lower classes in religious knowledge, the *Pásúpata*, the *Pancharátra*, and other works, fit for nightly meditation, were composed by SIVA, and others, in an hundred and ninety-two parts on different subjects.

What follow are not really divine, but contain infinite contradictions. *Sánc'hya* is twofold, that with IS'WARA and that without IS'WARA. The former is entitled *Pátanjala* in one chapter of four sections, and is useful in removing doubts by pious contemplation; the second, or *Cá-pila*, is in six chapters on the production of all things by the union of PRACRITI, or *nature*, and PURUSHA, or the *first male*: it comprizes also, in eight parts, rules for devotion, thoughts on the invisible power, and other topics. Both these works contain a studied and accurate enumeration of natural bodies and their principles; whence this philoso-

phy

phy is named *Sānc'hya*. Others hold, that it was so called from its *reckoning three sorts of pam*.

The *Mimāṃsā*, therefore, is in *two* parts, the *Nyāya* in *two*, and the *Sānc'hya* in *two*; and these *six* schools comprehend all the doctrine of the Theists.

Last of all appears a work written by BUDDHA, and there are also *six* atheistical systems of philosophy, entitled *Yógachāra*, *Saudhānta*, *Tāit'hāshica*, *Mādhyamica*, *Digambara*, and *Chārvāc*; all full of indeterminate phrases, errors in sense, confusion between distinct qualities, incomprehensible notions, opinions not duly weighed, tenets destructive of natural equality, containing a jumble of atheism and ethics; distributed, like our orthodox books, into a number of sections, which omit what ought to be expressed, and express what ought to be omitted; abounding in false propositions, idle propositions, impertinent propositions. Some assert, that the heterodox schools have no *Upāṅga's*; others, that they have six *Anga's*, and as many *Sāṅga's*, or *bodies*, and other *appendices*.

Such is the analysis of universal knowledge, *practical* and *speculative*.

### THE COMMENTARY.

This first chapter of a rare Sanscrit book, entitled *Vidyāḍersa*, or a *View of Learning*, is written in so close and concise a style, that some parts of it are very obscure, and the whole requires an explanation. From the beginning of it we learn that the *Vēdas* are considered by the *Hindus* as the fountain of all knowledge, human and divine; whence the verses of them

them are said in the *Gītā* to be the *leaves* of that holy tree, to which the Almighty himself is compared :

*úrđhwa mūlam adhaś śác'ham aśwatt'ham prákravayajam  
ch'handánsi yasya pernáni yastam v́eda sa v́edavit.*

“ The wife have called the Incorruptible One an *Aśwatt'ha*, with its roots  
“ above and its branches below ; the leaves of which are the sacred measures.  
“ He who knows this tree knows the *V́eda's*.”

All the *Pandits* insist that *Aśwatt'ha* means the *Pippala*, or *Religious Fig-tree*, with heart-shaped, pointed, and tremulous leaves ; but the comparison of heavenly knowledge, descending and taking root on earth, to the *Fata*, or great *Indian fig-tree*, which has most conspicuously its roots on high, or at least his radiating branches, would have been far more exact and striking.

The *V́eda's* consist of three *Cáhda's*, or *General Heads* ; namely, *Carma*, *Jñyána*, *Upásaná* ; or *Works*, *Faith*, and *Worship* : to the first of which the author of the *Vidyádersa* wisely gives the preference, as *MENU* himself prefers *universal benevolence* to the *ceremonies* of religion :

*Japyénaiva tu sansiddhyèdbráhmañó nátra sansayah :  
Curyádanyatraivá curyánmaitró bráhmaña uchyaतः.*

That is, “ By silent adoration undoubtedly a *Bráhmañ* attains holiness ; but  
“ every *benevolent man*, whether he perform or omit that ceremony, is  
VOL. I. Y y “ justly

“justly styled a *Bráhma*.” This triple division of the *Véda*’s may seem at first to throw light on a very obscure line in the *Gîtâ* :

*Traigunyahvishayah védâ nistraigunya bhavárjuna ;*

Or, “The *Véda*’s are attended with *three* qualities : be not thou a man of “*three* qualities, O ARJUNA.”

But several *Pandits* are of opinion, that the phrase must relate to the three *Guna*’s, or *qualities* of the mind ; that of *excellence*, that of *passion*, and that of *darkness* ; from the last of which a hero should be wholly exempt, though examples of it occur in the *Véda*’s, where animals are ordered to be *sacrificed*, and where horrid incantations are inserted for the *destruction* of enemies.

It is extremely singular, as Mr. WILKINS has already observed, that, notwithstanding the fable of BRAHMA’S *four* mouths, each of which uttered a *Véda*, yet most ancient writers mention only *three Véda*’s, in order as they occur in the compound word *Rigyajushsâma* ; whence it is inferred, that the *At’harvan* was written or collected after the three first ; and the two following arguments, which are entirely new, will strongly confirm this inference. In the eleventh book of MÊNU, a work ascribed to the *first* age of mankind, and certainly of high antiquity, the *At’harvan* is mentioned by name, and styled the *Véda* of *Véda*’s ; a phrase which countenances the notion of DA’RA’ SHECU’H, who asserts, in the preface to his *Upanishat*, that “the *three* first *Véda*’s are named separately, because the “*At’harvan* is a corollary from them all, and contains the quintessence of “them.” But this verse of MÊNU, which occurs in a modern copy of  
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the work brought from *Bánáras*, and which would support the antiquity and excellence of the *fourth Vêda*, is entirely omitted in the best copies, and particularly in a very fine one written at *Gayá*, where it was accurately collated by a learned *Bráhmaṇ*; so that, as *MĒNU* himself, in other places, names only three *Vêda*'s, we must believe this line to be an interpolation by some admirer of the *Aṭharvan*; and such an artifice overthrows the very doctrine which it was intended to sustain.

The next argument is yet stronger, since it arises from *internal evidence*; and of this we are now enabled to judge by the noble zeal of Colonel *POLIER* in collecting *Indian* curiosities; which has been so judiciously applied, and so happily exerted, that he now possesses a complete copy of the *four Vêdas* in eleven large volumes.

On a cursory inspection of those books it appears, that even a learner of *Sanscrit* may read a considerable part of the *Aṭharvavêda* without a dictionary; but that the style of the other *three* is so obsolete, as to seem almost a different dialect. When we are informed, therefore, that few *Brahmans* at *Bánáras* can understand any part of the *Vêda*'s, we must presume, that none are meant, but the *Rîch*, *Yajush*, and *Saman*, with an exception of the *Aṭharvan*, the language of which is comparatively modern; as the learned will perceive from the following specimen:

*Yatra brahmadevô yanti dreshaya tapasâ saha agnir mantotra nayatwagnir-  
medhân dedhatumê, agnyê swâhâ. vāyurmān tatra nayatu rajah pranam  
dedhātu mē, vāyuvē swâhâ. sūryô mān tatra nayatu chaachukh suryô  
dedhātu mē, suryāya swâhâ; chandrov mān tatra nayatu manaschandro  
dedhatu mē, chandrāya suahâ. sômo mān tatra nayatu payah sômo dedhâru*



*mé, sómāya swáhā. Indrò mán tatra nayatu balamindrò dedhātu mé, indráya swáhā. ápò mán tatra nayatwámritammópatishtatu, adbhyaḥ swáhā. yatra brahmaná yánti díśhayaḥ tapasā saha, brahmā mán tatra nayatu brahma brahmā dedhātu mé, brahmanē swáhā.*

That is, "Where they, who know the Great One, go through holy rites  
 " and through piety, thither may *fire* raise me! May fire receive my fa-  
 " crifices! Mysterious praise to fire! May *air* waft me thither! May  
 " air increase my spirits! Mysterious praise to air! May the *Sun* draw  
 " me thither! May the sun enlighten my eye! Mysterious praise to the  
 " sun! May the *Moon* bear me thither! May the moon receive my  
 " mind! Mysterious praise to the moon! May the plant *Sóma* lead me  
 " thither! May *Sóma* bestow on me its hallowed milk! Mysterious  
 " praise to *Sóma*! May *INDRA*, or the *firmament*, carry me thither!  
 " May *INDRA* give me strength! Mysterious praise to *INDRA*! May  
 " *water* bear me thither! May water bring me the stream of immortali-  
 " ty! Mysterious praise to the waters! Where they, who know the  
 " Great One, go, through holy rites and through piety, thither may *BRAHMA*'  
 " conduct me! May *BRAHMA*' lead me to the Great One! Mysterious  
 " praise to *BRAHMA*!"

Several other passages might have been cited from the first book of the *Atharvan*, particularly a tremendous incantation with consecrated grass, called *Darbbha*, and a sublime hymn to *Cála*, or time; but a single passage will suffice to show the style and language of this extraordinary work. It would not be so easy to produce a genuine extract from the other *Vēda*'s. Indeed, in a book, entitled *Sivavēdānta*, written in *Sanscrit*, but in *Cáshmirian* letters, a stanza from the *Yajurvēda* is introduced; which deserves for its sublimity

sublimity to be quoted here; though the regular cadence of the verses, and the polished elegance of the language, cannot but induce a suspicion, that it is a more modern paraphrase of some text in the ancient Scripture:

*nataira sūryò bhāti nacha chañdra tāracaū, nēma vidyutò bhānti cuta ēva  
vahnih : tamēva bhāntam anubhāti servam, tasya bhāsā servamidam vibhāti.*

That is, “ There the sun shines not, nor the moon and stars. These light-  
“ nings flash not *in that place*; how should even fire blaze *there* ? God  
“ irradiates all this bright substance; and by its effulgence the universe is  
“ enlightened.”

After all, the books on divine knowledge, called *Vēda*, or what is known, and *Sruti*, or what has been heard, from revelation, are still supposed to be very numerous; and the *four* here mentioned are thought to have been selected, as containing all the information necessary for man. MOHSANI FA'NI', the very candid and ingenious author of the *Dabistān*, describes in his first chapter a race of old *Persian* sages, who appear from the whole of his account to have been *Hindus*; and we cannot doubt that the book of MAHA'BA'D, or MENU, which was written, he says, *in a celestial dialect*, means the *Vēda*; so that, as ZERA'TUSHT was only a reformer, we find in *India* the true source of the ancient *Persian* religion. To this head belong the numerous *Tantra*, *Mantra*, *Agama*, and *Nigama*, *Sāstra*'s, which consist of incantations and other texts of the *Vēdas*, with remarks on the occasions, on which they may be successfully applied. It must not be omitted, that the *Commentaries* on the *Hindu* Scriptures, among which that of VASISHTHA seems to be reputed the most excellent,

are innumerable; but, while we have access to the fountains, we need not waste our time in tracing the rivulets.

From the *Vedas* are immediately deduced the practical arts of *Chirurgery* and *Medicine*, *Musick* and *Dancing*; *Archery*, which comprizes the whole art of war; and *Architecture*, under which the system of *mechanical* arts is included. According to the *Pandits*, who instructed ABU'LF AZI, each of the *four* Scriptures gave rise to one of the *Upaveda's*, or *Sub-scriptures*, in the order in which they have been mentioned; but this exactness of analogy seems to favour of refinement.

Infinite advantage may be derived by *Europeans* from the various *medical* books in *Sanscrit*, which contain the names and descriptions of *Indian* plants and minerals, with their uses, discovered by experience, in curing disorders. There is a vast collection of them from the *Cheraca*, which is considered as a work of SIVA, to the *Róganirúpana* and the *Adana*, which are comparatively modern. A number of books, in prose and verse, have been written on *Musick*, with specimens of *Hindu* airs in a very elegant notation; but the *Silpa śāstra*, or *Body of Treatises on Mechanical Arts*, is believed to be lost.

Next in order to these are the six *Védānga's*, three of which belong to *Grammar*. One relates to religious Ceremonies; a fifth to the whole compass of *Mathematics*, in which the author of *Līlāvatī* was esteemed the most skilful man of his time; and the *sixth*, to the explanation of obscure words or phrases in the *Vedas*. The grammatical work of PA'NINI, a writer supposed to have been inspired, is entitled *Siddhānta Caumudi*, and is so abstruse as to require the lucubrations of many years before it can

be perfectly understood. When *Cáśínál'ha Serman*, who attended Mr. WILKINS, was asked what he thought of the *Páhiniya*, he answered very expressively, that "it was a forest;" but, since grammar is only an instrument, not the end, of true knowledge, there can be little occasion to travel over so rough and gloomy a path; which contains, however, probably some acute speculations in *Metaphysics*. The *Sanscrit* Profody is easy and beautiful: and the learned will find in it almost all the measures of the *Greeks*; and it is remarkable, that the language of the *Bráhmans* runs very naturally into *Sapphicks*, *Alcaicks*, and *Iambicks*. Astronomical works in this language are exceedingly numerous: seventy-nine of them are specified in one list; and if they contain the names of the principal stars visible in *India*, with observations on their positions in different ages, what discoveries may be made in science, and what certainty attained in ancient chronology?

Subordinate to these *Anga's* (though the reason of the arrangement is not obvious) are the series of *Sacred Poems*, the Body of *Law*, and the six Philosophical *Śastra's*; which the author of our text reduces to *two*, each consisting of *two* parts; and rejects a *third*, in *two* parts also, as not perfectly *orthodox*; that is, not strictly conformable to his own principles.

The first *Indian* Poet was VÁTIM'CI, author of the *Ramayana*, a complete epic poem on one continued, interesting, and heroick action; and the next in celebrity, if it be not superior in reputation for holiness, was the *Mahabharata* of VYÁ'SA. To him are ascribed the sacred *Purana's*, which are called, for their excellence, the *Eighteen*, and which have the following titles: BRAHME, or the *Great One*; PÉLMA, or the *Lotos*; BRÁHMA'ND'A, or the *Mundane Egg*; and AGNI, or *Fire*; (these four relate to the

the *Creation*;) VISHNU, or the *Pervader*; GARUD'A, or his *Eagle*; the Transformations of BRAHMA, SIVA, LINGA; NA'REDA, son of BRAHMA; SCANDA, son of SIVA; MARCANDE'YA, or the Immortal Man; and BHA-WISHYA, or the *Prediction of Futurity*; (these nine belong to the attributes and powers of the Deity;) and four others, MATSYA, VARA'HA, CU'RMA, VA'MENA, or as many incarnations of the Great One in his character of *Preserver*; all containing ancient traditions, embellished by poetry or disguised by fable. The eighteenth is the BHA'GAWATA, or Life of CRISHNA, with which the same poet is by some imagined to have crowned the whole series; though others, with more reason, assign them different composers.

The system of *Hindu Law*, besides the fine work called *MENUSMRITI*, or "what is remembered from MENU," that of YA'JNYAWALCYA, and those of sixteen other *Muni's*, with *Commentaries* on them all, consists of many tracts in high estimation, among which those current in *Bengal* are an excellent treatise on *Inheritances* by JI'MU'TA VA'HANA, and a complete *Digest*, in twenty-seven volumes, compiled a few centuries ago by RAGHUNANDAN, the *TRIBONIAN of India*, whose work is the grand repository of all that can be known on a subject so curious in itself, and so interesting to the *British government*.

Of the philosophical schools it will be sufficient here to remark, that the first *Nyāya* seems analogous to the *Peripatetick*; the second, sometimes called *Vaiśhika*, to the *Ionick*; the two *Mīmāṃsā's*, of which the second is often distinguished by the name of *Vēdānta*, to the *Platonick*; the first *Sāṅkhya* to the *Italic*; and the second, or *Pātanjala*, to the *Stoick*, Philosophy: so that GAUTAMA corresponds with ARISTOTLE, CANA'DA with THALLS, JAIMINI with SOCRATES, VYA'SA with PLATO,

CAPILA with PYTHAGORAS, and PATANJALI with ZENO: but an accurate comparison between the *Grecian* and *Indian* schools would require a considerable volume. The original works of those philosophers are very succinct; but, like all the other *Sástras*, they are explained, or obscured, by the *Upadersana*, or *Commentaries*, without end. One of the finest compositions on the philosophy of the *Védánta* is entitled *Yóga Vásisht'ha*, and contains the instructions of the great VASISHTHA to his pupil, RA'MA, king of *Ayódhyà*.

It results from this analysis of *Hindu* literature, that the *Véda*, *Upavéda*, *Védānga*, *Purāna*, *Dharma*, and *Dersāna*, are the six great *Sástras*, in which all knowledge, divine and human, is supposed to be comprehended. And here we must not forget, that the word *Sástra*, derived from a root signifying to ordain, means generally an ordinance, and particularly a sacred ordinance, delivered by inspiration. Properly, therefore, this word is applied only to sacred literature, of which the text exhibits an accurate sketch.

The *Súdra*'s, or fourth class of *Hindus*, are not permitted to study the six proper *Sástra*'s before enumerated; but an ample field remains for them in the study of *profane literature*, comprized in a multitude of popular books, which correspond with the several *Sástra*'s, and abound with beauties of every kind. All the tracts on *medicine* must, indeed, be studied by the *Vaidya*'s, or those who are born physicians; and they have often more learning, with far less pride, than any of the *Bráhmans*. They are usually poets, grammarians, rhetoricians, moralists; and may be esteemed in general the most virtuous and amiable of the *Hindus*. Instead of the *Véda*'s, they study the *Rájaniti*, or *Instruction of Princes*; and, instead of *Law*, the *Nitisástra*, or general system of *Ethicks*. Their *Sahitia*, or *Carya*

*Sástra*, consists of innumerable poems, written chiefly by the *medical* tribe, and supplying the place of the *Purána's*, since they contain all the stories of the *Rámáyana*, *Bhárata*, and *Bhágawata*. They have access to many treatises of *Alancára*, or Rhetorick, with a variety of works in modulated Prose. To *Upáçhyána*, or Civil History, called also *Rájatarangini*; to the *Nátaca*, which answers to the *Gándharvavéda*, consisting of regular *Dramatick* pieces in *Sanscrit* and *Prácrit*: besides which they commonly get by heart some entire dictionary and grammar. The best lexicon or vocabulary was composed in verse, for the assistance of the memory, by the illustrious AMARASHINA; but there are *seventeen* others in great repute. The best grammar is the *Mugdhatódha*, or the *Beauty of Knowledge*, written by a Góswámi, named VO'PADE'VA, and comprehending, in two hundred short pages, all that a learner of the language can have occasion to know. To the *Cósha's*, or dictionaries, are usually annexed very ample *Ticá's*, or *etymological commentaries*.

We need say no more of the heterodox writings, than that those on the religion and philosophy of BUDDHA seem to be connected with some of the most curious parts of *Asiatick* history, and contain, perhaps, all that could be found in the *Páli*, or *sacred language*, of the eastern *Indian* peninsula. It is asserted in *Bengal*, that AMARASHINA himself was a *Bauddha*; but he seems to have been a thief of tolerant principles, and like ABU'LFÁZL, desirous of reconciling the different religions of *India*.

Wherever we direct our attention to *Hindu* literature, the notion of *infinity* presents itself; and the longest life would not be sufficient for the perusal of near five hundred thousand stanzas in the *Purána's*, with a million more perhaps in the other works before mentioned. We may, however,

select

select the best from each *Sāstra*, and gather the fruits of science, without loading ourselves with the leaves and branches ; while we have the pleasure to find, that the learned *Hindus*, encouraged by the mildness of our government and manners, are at least as eager to communicate their knowledge of all kinds, as we can be to receive it. Since *Europeans* are indebted to the *Dutch* for almost all they know of *Arabick*, and to the *French* for all they know of *Chinese*, let them now receive from our nation the first accurate knowledge of *Sanscrit*, and of the valuable works composed in it ; but, if they wish to form a correct idea of *Indian* religion and literature, let them begin with forgetting all that has been written on the subject, by ancients or moderns, before the publication of the *Gītā*.



TO THE PRESIDENT.

MY DEAR SIR,

I HEREWITH send you six ancient Copper Plates, fastened together by a ring in two parcels, each containing three. They were found in digging foundations for some new works at the Fort of *Tanna*, the capital of *Salset*. The governor of *Bombay* informed me none of the *Gujerat Bramins* could explain the inscriptions. I obtained permission to bring them round with me, being desirous of submitting them to the investigation of the ASIATICK SOCIETY, under the promise of restoring them to the proprietor.

I have the honour to be with great respect,

Dear SIR WILLIAM,

Your most faithful humble Servant,

J. CARNAC.

February, 15, 1787.



[illegible]

## XIX.

## AN INDIAN GRANT OF LAND, IN Y. C. 1018,

*Literally translated from the Sanscrit, as explained by*

RA'MALO'CHAN PANDIT,

COMMUNICATED by GENERAL CARNAC.

O'M. VICTORY AND ELEVATION!

S T A N Z A S.

**M**AY He, who in all affairs claims precedence in adoration; may that  
*Gāṇanāyaka*, averting calamity, preserve you from danger!

2. May that SIVA constantly preserve you, on whose head shines  
 (GANGA) the daughter of JAHNU, resembling-the-pure-crescent-rising-from  
 the-summit-of-SUMERU! (*a compound word of sixteen syllables.*)

3. May that God, the cause of success, the cause of felicity, who keeps,  
 placed even by himself on his forehead a section of the-moon-with-cool-  
 beams, drawn-in-the-form-of-a-line-resembling-that-in-the-infinitely-bright  
 spike-of-a-fresh-blown-*Citāra* (who is) adorned-with-a-grove-of-thick-red  
 locks-tied-with-the-Prince-of-Serpents, be always present and favourable to  
 you!

4. The son of JI'MU'FACE'RU ever affectionate, named JI'MU'IAVA'  
 HANA, who, surely, preserved (the Serpent) S'ANC'HACHU'D'A from *Gatana*,  
 (the

(*the Eagle of VISHNU*) was famed in the three worlds, having neglected his own body, as if it had been grass, for the sake of others.

5. (*Two couplets in rhyme*) In his family was a monarch (*named*) CAPARDIN, (or, *with thick hair*, a title of MAHA'DE'VA,) chief of the race of SI'LA'RA, repelling the insolence of his foes; and from him came a son, named PULAS'ACTI, equal in encreasing glory to the sun's bright circle.

6. When that son of CAPARDIN was a new-born infant, through fear of him, homage was paid by all his collected enemies, with water held aloft in their hands, to the delight of his realm.

7. From him came a son, the only warrior on earth, named SRI'VAPPUNNA, a hero in the theatre of battle.

8. His son, called S'RI' JHANJHA, was highly celebrated, and the preserver of his country; he afterwards became the Sovereign of Gógni: he had a beautiful form.

8. From him came a son, whose-renown-was-far-extended-and-who-confounded-the-mind-with-his-wonderful-acts, the fortunate BAJJADA DE'VA. He was a monarch, a gem in-the-diadem-of-the-world's-circumference; who used only the forcible weapon of his two arms readily on the plain of combat; and in whose bosom the Fortune of Kings herself amorously played, as in the bosom of the foe of MURA, (or VISHNU.)

9. Like JAYANTA, son to the foe of VRITTA, (or INDRA,) like

SHANMU'CHA, (or CARTICE'YA,) son to PURA'RI, (or MAHA'DI'VA,) then sprang from him a fortunate son, with a true heart, invincible;

10. Who in liberality was CARNA before our eyes, in truth even YUDHISHTHIRA, in glory a blazing Sun, and the rod of CA'LA (or YAMA, *judge of the infernal regions*) to his enemies.

11. By whom the great counsellors, who were under his protection, and others near him, are preserved in this world. He is a conqueror, named with propriety S'ARANA'GATA VAJRAPANJARADE'VA.

12. By whom when this world was over-shadowed with continual presents of gold, for his liberality he was named JAGADARTHI, (or *Enriching the World*.) in the midst of the three regions of the universe.

13. Those Kings assuredly, whoever they may be, who are endued with minds capable of ruling their respective dominions, praise him for the greatness of his veracity, generosity, and valour; and to those Princes who are deprived of their domains, and seek his protection, he allots a firm settlement. May he, the grandfather of the RA'YA, be victorious! He is the spiritual guide of his counsellors, and then are his pupils. Yet farther.

14. He, by whom the title of GO'MMA'YA was conferred on a person who attained the object of his desire; by whom the realm, shaken by a man named T'YAFADE'VA, was even made firm; and by whom, being the Prince of Mamalamkwa, (I suppose, *Mamla*, or *Bomlay*.) security from fear was given to me broken with affliction. He was the King, named S'K.

VINTANA,

VIRUDANCA. How can he be otherwise painted? *Here six syllables are effaced in one of the Grants; and this verse is not in the other.*

15. His son *was* named BAJJADADĒ'VA, a gem on the forehead of monarchs, eminently skilled in morality; whose deep thoughts all the people, clad in horrid armour, praise even to this day.

16. Then was born his brother, the Prince ARICE'SARI, (a lion among his foes,) the best of good men; who, by overthrowing the strong mountain of his proud enemies, did the act of a thunderbolt; having formed great designs even in his childhood, and having seen the Lord of the Moon (MAHA'DĒ'VA) *standing* before him, he marched by his father's order, attended by his troops, and by valour subdued the world.

Yet more—————

17. Having raised up his slain foe on his sharp sword, he so afflicted the women in the hostile palaces, that their forelocks fell disordered, their garlands of bright flowers dropped from their necks on the vases of their breasts, and the black lustre of their eyes disappeared.

18. A *warriour*, the plant of whose fame grows up over the temple of BRAHMA's Egg, (the universe,) from the repeated-watering-of-it-with-the-drops-that-fell-from-the eyes of-the-wives-of-his-slaughtered-foe.

Afterwards by the multitude of his innate virtues (*then follows a compound word of an hundred and fifty-two syllables*) the-fortunate-ARICE'SA-RI-DE'VARA'JA-Lord-of-the-great-circle-adorned-with-all-the-company-  
of-

of - princes - with - VAJRAPANJARA - of - whom - men - seek - the - protection -  
 an - elephant's - hook - in - the - forehead - of - the - world - pleased - with - encreasing -  
 vice - a - Flamingo - bird - in - the - pool - decked - with - flowers - like - those - of - paradise -  
 and - with - A'DITYA - PANDITA - chief - of - the - districts - of - the - world - through - the -  
 liberality - of - the - lord - of - the - Western - Sea - holder - of - innate - knowledge - who -  
 bears - a - golden - eagle - on - his - standard - descended - from - the - stock - of - JI'MU'TA -  
 VA'HANA - king - of - the - race - of - *Silāra* - Sovereign - of - the - City - of - *Tagara* - Su-  
 preme - ruler - of - exalted - counsellors - assembled - when - extended - fame - had - been -  
 attained (*the monarch* thus described) governs - the - whole - region - of - *Cōncana* -  
 consisting - of - fourteen - hundred - villages - with - cities - and - other - places - compre-  
 hended - in - many - districts - acquired - by - his - arm. Thus he supports the burden  
 of thought concerning this domain. The Chief-Minister s'RI' VA'SAPAIYA,  
 and the very-religiously-purified s'RI' VA'RḌHIYAPAIYA, being at this time  
 present, he, the fortunate ARICE'SARIDE'VARA'JA, Sovereign of the great  
 circle, *thus addresses* even all who inhabit the city - s'RI' STHA'NACA, (*or the*  
*Mansion of LACSHMI*'), his-own-kinfmen-and-others-there-assembled, princes-  
 counsellors - priests - ministers - superiors - inferiors - subject - to - his - commands, also  
 the - lords - of - districts, - the - Governors - of - towns - chiefs - of - villages - the - masters -  
 of - families - employed - or - unemployed - servants - of - the - King - and - his - country -  
 men. Thus he greets all the holy-men-and-others-inhabiting - the - city - of  
*Hanyamana*. Reverence be to you, as it is becoming, with all the marks  
 of respect salutation, and praise !

### S T A N Z A.

Wealth is inconstant ; youth, destroyed in an instant ; and life, placed be-  
 tween the teeth of CRITANTA, (*or YAMA before mentioned.*)



Nevertheless, neglect *is shown* to the felicity of departed ancestors. Oh! how astonishing are the efforts of men!

And thus,—Youth is publicly swallowed-up-by-the-giants Old-Age admitted-into-its-inner mansion; and the bodily-frame-is-equally-obnoxious-to-the-afflict-of-death-of-age-and-the-misery-born-with-man-of-separation-between-united-friends-like-falling-from-heaven-into-the-lower regions. Riches and life are two things more-moveable-than-a-drop-of-water-trembling-on-the-leaf-of-a-lotos-shaken-by-the-wind; and the world is like-the-first delicate-foilage-of-a-plantain-tree. Considering this in secret with a firm dispassionate understanding, and also the fruit of liberal donations mentioned *by the wise, I called to mind these*

### S T A N Z A S.

1. In the *Satya*, *Trétá*, and *Dwáper* ages, great piety was celebrated: but in this *Caliyuga* the *Muni's* have nothing to commend but liberality.

2. Not so productive of fruit is learning, not so productive is piety, as liberality, say the *Muni's*, in this *Cali* age. And thus was it said by the Divine *VYA'SA*:

3. Gold *was* the first offspring of Fire; the Earth *is* the daughter of *VISHNU*, and kine are the children of the Sun: the three worlds, *therefore*, are assuredly given by him, who makes a gift of gold, earth, and cattle.

4. Our deceased fathers clap their hands, *our* grandfathers exult: saying, "a donor of land is born in our family: he will redeem us."

5. A donation of land to good persons, for holy pilgrimages, and on the (five) solemn days of the moon, is the mean of passing over the deep boundless ocean of the world.

6. White parasols, and elephants mad with pride, (the *insignia* of royalty) are the flowers of a great land: the fruit is INDRA in heaven.

Thus, confirming the declarations of the ancient *Muni's* learned in the distinction-between-justice-and-injustice, for the sake of benefit to my mother, my father, and myself, on the fifteenth of the bright moon of *Cartica* in the middle of the year *Pingala*, (perhaps of the *Serpent*;) when nine hundred and forty years, save one, are reckoned as past from the time of King *s'ACA*, or, in figures, the year 939, of the bright moon of *Cartica* 15; (that is,  $1708-939=769$  years ago from Y. C. 1787.) The moon being then full and eclipsed, I having bathed in the opposite sea resembling the girdles round the waist of the female Earth, tinged with a variety of rays like many exceedingly bright rubies, pearls and other gems, with water whose mud was become musk through the frequent bathing of the fragrant bosom of beautiful Goddesses rising up after having dived in it; and having offered to the sun, the divine luminary, the gem of one circle of heaven, eye of the three worlds, Lord of the lotus, a dish embellished with flowers of various sorts, (this dish is filled with the plant *Dartha*, rice in the husk, different flowers, and sandal,) have granted to him, who has viewed the preceptor of the Gods and of Demons, who has adored the Sovereign Deity the husband of *AMERICA*, (or *DURGA*;) has sacrificed-caused-others-to-sacrifice,-has read-caused-others-to-read-and-has-performed-the-rest-of-the-six (sacerdotal) functions; who is eminently skilled in the whole business of performing sacrifices, who has

held-up the-root-and-stalk-of-the-sacred-lotos; who-inhabits-the-city-SRĪ ST'HA'NACA, (or abode of Fortune,) descended from JAMADAGNĪ; who-performs-due-rites-in-the-holy-stream; who-distinctly-knows-the-mysterious-branches, (of the *Vēdas*,) the domestick priest, the reader, SRĪ TICCAPAIYA, son of SRĪ CHCH'HINTAPAIYA the astronomer, for-the-purpose-of-sacrificing-causing-others-to-sacrifice-reading-causing-others-to-read-and-discharging-the-rest-of-the-six-(sacerdotal-) duties, of performing-the (daily service of) *Vaiśvadeva* with offerings of rice, milk, and materials of sacrifice, and-of-completing-with due-solemnity the sacrifice-of-fire-of doing-such-acts-as-must-continually-be-done, and such-as-must-occasionally-be-performed, of paying-due-honours to guests and strangers, and-of-supporting his-own-family, the village of *Chāvināra* standing-at-the-extremity-of-the-territory of *Tatsarāja*, and the boundaries of which are, to the east, the village of *Pūḡambā* and a water-fall-from a mountain; to the south, the villages of *Nāgambā* and *Mūladāṅgaricā*; to the west, the river *Sāmbarapallicā*; to the north, the villages of *Sāmbivē* and *Cāliyāla*; and besides this the full (district) of *Tocabalā Pallicā*, the boundaries of which are to the east, *Sidābalī*; to the south, the river *Mot'hala*; to the west, *Cācāḍeva*, *Hallapallicā*, and *Baḍaviraca*; to the north, *Talāvalī Pallicā*; and also the village of *Aulacīyā*, the boundaries of which (are) to the east, *Taḍāga*; to the south, *Gōvinī*; to the west, *Charicā*, to the north, *Calibalā-yachōli*: (that land) thus surveyed-on the four-quarters-and limited-to-its-proper-bounds, with-its herbage-wood-and-water, and with-power-of-punishing-for-the-ten-crimes, except that before given as the portion of *Dēva*, or of *Brahmā*, I have hereby released, and limited-by-the-duration-of-the-sun-the-moon-and-mountains, confirmed with-the-ceremony-of adoration, with a copious effusion of water, and with the highest acts of-worship; and the same land shall be enjoyed by his lineal-and-collateral-heirs, or caused-to-

be-enjoyed, nor shall disturbance be given by any person whatever : since it is thus declared by great *Muni's*.

*S T A N Z A S.*

1. The earth is enjoyed by many kings, by SA'GAR, and by others: to whomsoever the soil at any time belong, to him at that time belong the fruits of it.

2. A speedy gift is attended with no fatigue; a continued support, with great trouble: therefore, even the *Rishu's* declare, that a continuance of support is better than a single gift.

3. Exalted Emperors, of good dispositions, have given land, as RA'MA-BHADRA advises, again and again: this is the true bridge of justice for sovereigns: from time to time (O kings) that bridge must be repaired by you.

4. Those possessions here below, which have been granted in former times by sovereigns, given for-the-sake-of-religion-increase-of-wealth-or-of-ame, are exactly equal to flowers, which have been offered to a Deity: what good man would resume *such gifts*?

Thus, confirming the precepts of ancient *Muni's*, all future kings must gather the fruit-of-observing-religious-duties; and let not the stain-of-the-crime-of-destroying-this-grant be borne henceforth by any-one: since, whatever prince, being supplicated, shall, through avarice, having-his-mind-wholly-surrounded-with-the-gloom-of-ignorance-contemptuously-dismiss-the-injured-suppliant, he, being guilty of five great and five small crimes, shall

long in darkness inhabit *Raurava*, *Mahāraurava*, *Aidha*, *Tāmisra*, and the other places of punishment. And thus it is declared by the divine VYĀSA:

### S T A N Z A S.

1. He who seizes land, given-by-himself, or by-another, (sovereign,) will rot among worms, himself a worm, in the midst of ordure.

2. They who seize granted-land, are born again, living with great fear in dry cavities of trees in the unwatered forests on the *Vinddhan* (mountains.)

3. By seizing one cow, one vesture, or even one nail's breadth of ground, a *king* continues in hell till an universal destruction of the world has happened.

4. By (a gift of) a thousand gardens, and by (a gift of) a hundred pools of water, by (giving) a hundred *lac* of oxen, a disseisor of (granted) land is not cleared from offence.

5. A grantor of land remains in heaven sixty thousand years; a disseisor, and he who refuses to do justice, continues as many (years) in hell.

And agreeably to this, in what is written by the hand of the Secretary, (the King,) having ordered it, declares his own intention; as it is written by the command of me, Sovereign of the Great Circle, the fortunate ARICĪ'SARĪ DE'VARA'JA, son of the Sovereign of the Great Circle, the Fortunate, invincible, DE'VARA'JA.

And

And this is written, by order of the Fortunate King, by me JO'-UBA, the brother's-son-of S'RI' NA'GALAIYA, -the great-Bard, -dwelling-in-the royal palace; engraved-on-plates-of-copper by VE'DAPAIYA's son MANA DHA'RA PAIYA. Thus (it ends.)

Whatever herein (may be) defective in-one-syllable, or have-one-syllable-redundant, all that is (nevertheless) complete evidence (of the grant.) Thus (ends the whole.)

## TO THE PRESIDENT.

DEAR SIR,

**I** DO myself the honour to send you a few Remarks on *Tagara*, and beg leave to submit them to your judgment. Inquiries of that kind are generally very dry; and unluckily I have no talent for amplification. I have collected all I could find in the ancient authors, and endeavoured, by bringing the whole together, to elucidate a subject, which must be interesting to the ASIATICK SOCIETY; and this, I hope, will secure me their indulgence. I have been as sparing as possible of *Greek* quotations: I am not fond of them; however, I have ventured a few, which I thought absolutely necessary. With respect to the historical part, you will find I am not conversant with the *Hindu* antiquities: indeed, I have no time to study languages.

I am,

DEAR SIR,

Your most obedient humble Servant,

F. WILFORD.

*Russapugla, June 10, 1787.*

## REMARKS ON THE CITY OF TAGARA.

By *LIEUTENANT FRANCIS WILFORD.*

THE expedition of ALEXANDER having made the *Greeks* acquainted with the riches of *India*, they soon discovered the way by sea into that country, and, having entered into a commercial correspondence with the natives, they found it so beneficial, that they attempted a trade thither.

PTOLEMY PHILADELPHUS, king of *Egypt*, in order to render the means easy to merchants, sent one DIONYSIUS into the southern parts of *India*, to inquire into the nature of that country, its produce, and manufactures.

It was then *Tagara* began to be known to the *Greeks*, about 2050 years ago.

ARRIAN, in his *Periplus Maris Erythraei*, says it was a very large city, and that the produce of the country, at that early period, consisted chiefly of coarse *Dungarees*, (*Othonium vulgare*,) of which vast quantities were exported; muslins of all sorts, (*Sindones omnis generis*,) and a kind of cotton stuff, dyed of a whitish purple, and very much of the colour of the flowers of mallows, whence called *Molechyna*.

All kinds of mercantile goods throughout the *Deccan* were brought to *Tagara*, and from thence conveyed on carts to *Baroach*, (*Barygaza*.)



ARRIAN informs us, that *Tagara* was about ten days journey to the eastward of another famous mart, called *Pluthana*, or *Plúthana*.

That *Plúthana* was twenty days journey to the southward of *Baroach*. Also,

That the road was through the *Balagaut* mountains.

And here we must observe, that the *Latin* translation of the *Periplus*\* by STUCKIUS is very inaccurate, and often erroneous; as in the following passage, where ARRIAN, speaking of *Tagara*, says

“ Κατάγεται δὲ ἐξ αὐτῶν πορείαις ἀμαξῶν καὶ ἀνοδίαις μεγάλαις εἰς τὴν Βαρύγαζαν ;

which STUCKIUS translates thus,

“ Ex his autem emporiis, *per loca invia et difficillima*, res Barygizam “ *plaustris convehuntur.*”

But it should be,

“ Ex his autem emporiis, *per maximos ascensus*, res Barygizam *deorsum* “ *feruntur.*”

Κατάγω signifies *deorsum ferre*, (to bring down,) not *convehere*.

Ανοδίαί μεγάλαι should be translated *per maximos ascensus*. *Ανοδία*, or *ἀνοδος*, in this place, signifies *an ascent, a road over hills*; and this meaning is plainly pointed out by the words *κατάγεται* and *μεγάλαις*.

In short, ἀροῖαι μυρίαι is the true translation of the *Hindoo* word *Bala-gaut*, the name of the mountains through which the goods from *Tagara* to *Baroach* used to be conveyed.

This passage in *ARRIAN* is the more interesting, as it fixes the time when the *Bala-gaut* mountains were first heard of in *Europe*.

The bearing from *Tagara* to *Pluthana* is expressly mentioned by *ARRIAN*, (πρὸς ἀνατολὴν) but is left out by *STUCKIUS*.

*Pluthana* is an important point to be settled, as it regulates the situation of *Tagara*.

It still exists, and goes nearly by the same name, being called to this day *Plutanah*. It is situated on the southern bank of the *Godavery*, about 217 British miles to the southward of *Baroach*.

These 217 miles, being divided by twenty, the number of days travellers were between *Pultanah* and *Baroach*, according to *ARRIAN*, give nearly eleven miles per day, or five cofs, which is the usual rate of travelling with heavy loaded carts.

The onyx, and several other precious stones, are still found in the neighbourhood of *Pultanah*, as related by *ARRIAN*; being washed down by torrents from the hills during the rains, according to *PLINY*.

*ARRIAN* informs us, that the famous town of *Tagara* was about ten days journey to the eastward of *Pultanah*.

According to the above proportion, these ten days (or rather somewhat less\*) are equal to about 100 British miles; and consequently *Tagara* by its bearing and distance from *Pultana*, falls at *Deoghur*, a place of great antiquity, and famous through all *India* on account of the *Pagodas* of *Eloura*. It is now called *Doulet-abad*, and about four cofs N. W. of *Aurangabad*.

PTOLEMY agrees very well with ARRIAN, with respect to distances and bearings, if we admit that he has mistaken *Baithana*, or *Paithana*, for *Plithana*; and this, I am pretty sure, is really the case, and may be easily accounted for, as there is very little difference between ΠΑΙΘΑΝΑ and ΠΛΙΘΑΝΑ in the *Greek* character.

*Paithana*, now *Pattan*† or *Putten*, is about half way between *Tagara* and *Plithana*.

According to PTOLEMY, *Tagara* and *Pattan* were situated to the northward of the *Baund-Ganga* (*Binda* or *Bynda* river,) commonly called *Godavery*; and here PTOLEMY is very right.

In Mr. BUSSY's *map*, *Pattan* is placed to the southward of the *Godavery*, but it is a mistake.

It appears from ARRIAN's *Periplus*, that, on the arrival of the *Greeks* into the *Deccan*, above 2000 years ago, *Tagara* was the *metropolis* of a large district called *Ariaca*, which comprehended the greatest part of Subah *Au-*

\* *ἑξήκοντα καὶ δύο ἡμέρας* quasi dies decem.

† *Patane* Tab. Peutinger. *Patinna* Anonym. Ravenn.

*rungabad*, and the southern part of *Concan*; for the northern part of that district, including *Damaun*, *Callian*, the Island of *Salset*, *Bombay*, &c. belonged to the *Rajah* of *Larkeh* or *Lar*, according to *ARRIAN* and *EBN SAID AL MAGREBI*.

It is necessary to observe here, that, though the author of the *Periplus* is supposed to have lived about the year 160 of the present era, yet the materials he made use of in compiling his directory are far more ancient: for, in speaking of *Tagara*, he says that the *Greeks* were prohibited from landing at *Callian*, and other harbours on that coast. Now it is well known that, after the conquest of *Egypt*, the *Romans* had monopolized the whole trade to *India*, and would allow no foreigner to enter the Red Sea; and consequently this passage has reference to an earlier period, previous to the conquest of *Egypt* by the *Romans*.

About the middle of the first century, *Tagara* was no longer the capital of *Ariaca*, *Rajah* *SALBAHAN* having removed the seat of the empire to *Pattan*.

*PTOLEMY* informs us, that *Paithana*, or *Pattan*, had been the residence of a prince of that country, whose name the *Greeks* have strangely disfigured: we find it variously spelt, in different MSS. of *PTOLEMY*, *Siripolemæus*, *Siropolemæus*, *Siroptolemaus*, &c.

Yet, when we consider that, whenever *Pattan* is mentioned by the *Hindoos*, they generally add, it was the residence of *Rajah* *SALBAHAN*\*, who,

\* Making use of the very words of *Ptolemy*.

in the dialect of the *Deccan*, is called *Salivanam*, or *Salibanam*, I cannot help thinking that the *Greeks* have disfigured this last word *Salibanam* into *Saripalam*, from which they have made *Siripolemarus*, *Sirropolemarus*, &c.

BICKERMAJIT ruled for some time over the northern parts of the *Deccan*; but the *Rajahs*, headed by SALBAHAN, having revolted, they gave him battle, and he was slain. *Tagara* became again the metropolis of *Araca*; at least it was so towards the latter end of the eleventh century, as it appears from a grant of some lands in *Concan*, made by a *Rajah* of *Tagara*; this grant still exists, and was communicated to the ASIATICK SOCIETY by General CARNAC.

When the *Mussulmans* carried their arms into the *Deccan* about the year 1293, *Tagara*, or *Deoghur*, was still the residence of a powerful *Rajah*, and remained so till the time of SHAH-JEHAN, when the district belonging to it became a *Subah* of the *Mogul* Empire. Then *Tagara* was deserted; and *Kerkhi*, four coss to the south-east of it, became the capital. This place is now called *Aurangabad*.

Thus was destroyed the ancient kingdom or *Rajaship* of *Tagara*, after it had existed with little interruption above 2000 years; that is to say, as far as we can trace back its antiquity.

It may appear astonishing, that, though the *Rajah* of *Tagara* was possessed of a large tract on the sea coast, yet all the trade was carried on by land.

Formerly

Formerly it was not so. On the arrival of the *Greeks* into the *Deccan*, goods were brought to *Callian*, near *Bombay*, and then shipped off. However, a *Rajah* of *Larikeh*, or *Lar*, called *Saudanes*, according to *ARRIAN*, would no longer allow the *Greeks* to trade either at *Callian*, or at the harbours belonging to him on that coast, except *Baroach*; and whenever any of them were found at *Callian*, or in the neighbourhood, they were confined, and sent to *Baroach* under a strong guard. *ARRIAN*, being a *Greek* himself, has not thought proper to inform us what could induce the *Rajah* to behave in this manner to the *Greeks*; but his silence is a convincing proof that they had behaved amiss; and it is likely enough, that they had attempted to make a settlement in the island of *Salset*, in order to make themselves independent, and facilitate their conquests into the *Deccan*.

The fears of the *Rajah* were not groundless; for the *Greek* kings of *Bactriana* were possessed of the *Punjab*, *Cabul*, &c. in the north of *India*.

There were other harbours, to the south of *Callian*, belonging to the *Rajah* of *Tagara*, but they were not frequented, on account of *pirates*, who, according to *PLINY*, *ARRIAN*, and *PTOLIMY*, infested these countries, in the very same manner they do now.

## XX.

## ON THE PANGOLIN OF BAHAR.

Sent by MATTHEW LESLIE, Esq.

THE singular animal, which M. BUFFON describes by the name of *Pangolin*, is well known in Europe since the publication of his Natural History, and GOLDSMITH's elegant abridgment of it; but, if the figure exhibited by BUFFON was accurately delineated from the three animals, the spoils of which he had examined, we must consider that, which has been lately brought from *Caracdiah* to *Chitrah*, and sent thence to the Presidency, as a remarkable variety, if not a different species, of the *pangolin*. Ours has hardly any neck; and, though some filaments are discernible between the scales, they can scarce be called bristles; but the principal difference is in the tail; that of BUFFON's animal being long, and tapering almost to a point; while that of ours is much shorter, ends obtusely, and resembles in form and flexibility the tail of a lobster. In other respects, as far as we can judge from the dead subject, it has all the characters of BUFFON's *pangolin*; a name derived from that by which the animal is distinguished in *Java*, and consequently preferable to *Manis* or *Pholidotus*, or any other appellation deduced from an European language. As to the *scales lizard*, the *scaled armadillo*, and the *five-nailed ant-eater*, they are manifestly improper designations of this animal; which is neither a *lizard*, nor an *armadillo*, in the common acceptance; and, though it be an *ant-eater*, yet it essentially differs from the *hairy* quadruped usually known by that general description. We are told that the *Malabar* name of this animal is *Alungu*. The natives of *Bahar* call it *Bajar-cit*, or, as they explain the



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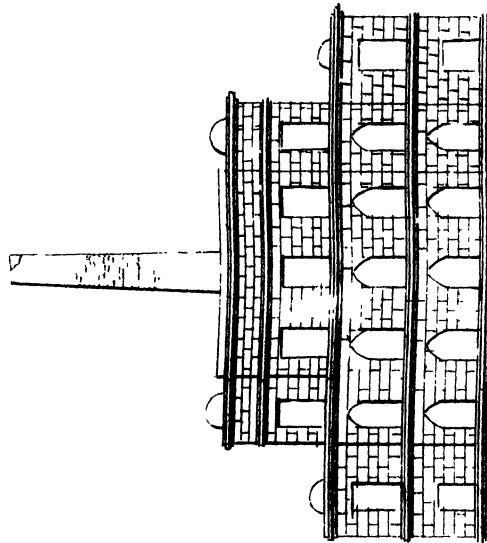
the word, *stone-vermine*; and in the stomach of the animal before us was found about a teacupful of small *stones*, which had probably been swallowed for the purpose of facilitating digestion: but the name alludes, I believe, to the *hardness* of the scales; for *vajracīta* means, in Sanscrit, the *diamond*, or *thunderbolt reptile*; and *vajra* is a common figure in the *Indian* poetry for any thing excessively *hard*. The *vajracīta* is believed by the *Pandits* to be the animal which gnaws their *sacred stone*, called *Śāṅgī-maśilā*; but the *pangolin* has apparently no teeth, and the *salgrams*, many of which look as if they had been worm-eaten, are perhaps only decayed in part by exposure to the air.

This animal had a long tongue, shaped like that of a *cameleon*; and, if it was nearly adult, as we may conclude from the young one found in it, the dimensions of it were much less than those which *BURFON* assigns generally to his *pangolin*; for he describes its length as six, seven, or eight feet, including the tail, which is almost, he says, as long as the body, when it has attained its full growth; whereas ours is but thirty-four inches long from the extremity of the tail to the point of the snout, and the length of the tail is fourteen inches: but, exclusively of the head, which is five inches long, the tail and body are, indeed, nearly of the same length; and the small difference between them may shew, if *BURFON* be correct in this point, that the animal was young. The circumference of its body in the thickest part is twenty inches, and that of the tail only twelve.

We cannot venture to say more of this extraordinary creature, which seems to constitute the first step from the quadruped to the reptile, until we have examined it alive, and observed its different instincts; but as we are assured that it is common in the country round *Khánpūr*, and at *Chatigām*,

where the native *Muselmans* call it the *land-carp*, we shall possibly be able to give on some future occasion a fuller account of it. There are in our *Indian* provinces many animals, and many hundreds of medicinal plants, which have either not been described at all, or, what is worse, ill described by the naturalists of *Europe*; and, to procure perfect descriptions of them from actual examination, with accounts of their several *uses* in medicine, diet, or manufactures, appears to be one of the most important objects of our institution.





THE STAFF OF FEROZ SHAH.

## XXI.

## INSCRIPTIONS ON THE STAFF OF FIRUZ SHAH.

*Translated from the Sanscrit, as explained by*

RA'DHA'CA'NTA SARMAN.

ON a very singular monument near *Dehli*, an outline of which is here exhibited, and which the natives call the Staff of FIRUZ SHAH, are several old inscriptions, partly in ancient *Nāgarī* letters, and partly in a character yet unknown; and Lieutenant Colonel POLIER, having procured exact impressions of them, presents the Society with an accurate Copy of all the Inscriptions. Five of them are in *Sanscrit*, and, for the most part, intelligible; but it will require great attention and leisure to decypher the others. If the language be *Sanscrit*, the powers of the unknown letters may, perhaps, hereafter be discovered by the usual mode of decyphering; and that mode, carefully applied even at first, may lead to a discovery of the language. In the mean time, a literal version of the legible Inscriptions is laid before you. They are, on the whole, sufficiently clear; but the sense of one or two passages is at present inexplicable.

## I.

The first, on the southwest side of the pillar, is perfectly detached from the rest: it is about seventeen feet from the base, and two feet higher than the other inscriptions.

O'M.

In the year 1230, on the first day of the bright half of the month

C c c 2

*Vansuc'h*

*Vaisāc'h* (a monument) of the Fortunate-VISALA-DE'VA-son-of-the-Fortunate-AMILLA-DE'VA,-King-of-Sacambhari.

## II.

The next, which is engraved as a specimen of the character, consists of two stanzas in four lines; but each hemistich is imperfect at the end, the two first wanting seven, and the two last *five*, syllables. The word *Sācam-bhari* in the former inscription enables us to supply the close of the *third* hemistich.

## O.M.

As far as *Vindhya*, as far as *Himādri*, (the Mountain of Snow,) he was not deficient in celebrity . . . . . making *Aryāvarta* (the Land of Virtue, or *India*) even once more what its name signifies . . . . . He having departed, PRATIVA'HAMA'NA TILACA (is) king of *Sācam-bhari*: (*Sācam* only remains on the monument.) By us (the region between) *Himavat* and *Vindhya* has been made tributary.

In the year from *Srī VICRAMA'DITYA* 123, in the bright half of the month *Vaisāc'h* . . . . at that time the *Rājaputra Srī SALLACA* was Prime Minister.

The second stanza, supplied partly from the last inscription, and partly by conjecture, will run thus:

*vritte sa prativāhamāna tilacah śacāmbharībhūpatih  
asmābhih caradam vyadhāyi himavadvindhyaṭavimāṇḍalam.*







The date 123 is here perfectly clear; at least it is clear that only *three* figures are written, without even room for a cypher after them; whence we may guess that the double circle in the former inscription was only an ornament, or the neutral termination *am*: if so, the date of *both* is the year of CHRIST *sixty-seven*; but if the double circle be a *Zero*, the monument of VI'SALA DE'VA is as modern as the year 1174, or *nineteen* years before the conquest of *Dehli* by SHIHA'BU'DDI'N.

### III and IV.

The two next inscriptions were in the same words, but the *stanzas*, which in the fourth are extremely mutilated, are tolerably perfect in the third, wanting only a few syllables at the beginning of the hemistichs:

yah cshivéshu prahartá nripatishu vinamatcandharéshu prafannah  
 —vah śambi puríndrah jagatí vijayaté víśala cshónipálah  
 . . . da śájnya éśha vijayí śantánajánátmajah  
 . . púnán cshemáśtu bruvatamudyógaśúnyanmanah

*He* who is resentful to kings intoxicated with pride, indulgent to those whose necks are humbled, an INDRA in the city of *Causámhi*, (I suspect *Causámhi*, a city near *Hastinápur*, to be the true reading,) *who* is victorious in the world, VI'SALA, sovereign of the earth: he gives . . . his commands being obeyed, he is a conqueror, the son of SANTA'NAJA'NA, whose mind, when his foes say, 'Let there be mercy,' is free from further hostility.

This inscription was engraved, in the presence of SRI' TILACA RA'JA, by SRI'RATI, the son of MA'RAVA, a *Cáya-t'ha*, of a family in *Gauda*, or *Bengal*.

## V.

The fifth seems to be an elegy on the death of a king named VIGRAHA, who is represented as only slumbering. The last hemistich is hardly legible, and very obscure; but the sense of both stanzas appears to be this.

## O'M.

1. An offence to the eyes of (thy) enemy's comfort (thou) by-whom-fortune-was-given-to-every suppliant, thy fame, joined to extensive dominion, shines, as we define, before us: the heart of (thy) foes was vacant, even as a path in a desert, where men are hindered from passing, O fortunate VIGRAHA R V'JAD1'VA, in the jubilee occasioned by thy march.

2. May thy abode, O VIGRAHA, sovereign of the world, be fixed, as in reason, (it ought) in the bosoms, embellished with love's allurements, and full of dignity, of the women with beautiful eyebrows, who were married to thy enemies! Whether thou art INDRA, or VISHNU, or SIVA, there is even no deciding thy foes (are) fallen, like descending water. Oh! why dost thou through delusion, continue sleeping?

## XXII.

## A CONVERSATION WITH ABRAM, AN ABYSSINIAN,

*Concerning the CITY of GWENDER*

## AND THE SOURCES OF THE NILE.

BY THE PRESIDENT.

HAVING been informed that a native of *Abyssinia* was in *Calcutta*, who spoke *Arabick* with tolerable fluency, I sent for and examined him attentively on several subjects with which he seemed likely to be acquainted. His answers were so simple and precise, and his whole demeanour so remote from any suspicion of falsehood, that I made a minute of his examination, which may not perhaps be unacceptable to the Society. *Gwender*, which *BERNIER* had long ago pronounced a *capital city*, though *LUDOLF* asserted it to be only a *military station*, and conjectured, that in a few years it would wholly disappear, is certainly, according to *ABRAM*, the *Metropolis* of *Abyssinia*. He says, that it is nearly as large and as populous as *Misr*, or *Kahera*, which he saw on his pilgrimage to *Jerusalem*; that it lies between two broad and deep rivers, named *Caha* and *Anerib*, both which flow into the *Nile* at the distance of about fifteen days' journey; that all the walls of the houses are of a red stone, and the roofs of thatch; that the streets are like those of *Calcutta*, but that the ways, by which the king passes, are very spacious; that the palace, which has a plastered roof, resembles a fortress, and stands in the heart of the city; that the markets of the town abound in pulse, and have also wheat and barley, but no rice; that sheep and goats are in plenty among them,

and

and that the inhabitants are extremely fond of milk, cheefe, and whey; but that *the country people* and *country* make no scruple of drinking the blood, and eating the raw flesh, of an ox, which they cut without caring whether he is dead or alive; that this savage diet is, however, by no means general. Almonds, he says, and dates are not found in his country; but grapes and peaches ripen there; and in some of the distant provinces, especially at *Cáru-dar*, wine is made in abundance; but a kind of mead is the common inebriating liquor of the *Abyssinians*. The late king was *Tilca Mahát*, (the first of which words means *root* or *origin*;) and the present, his brother, *Tilca Jersis*. He represents the royal forces at *Gwender* as considerable; and asserts, perhaps at random, that near forty thousand horse are in that station. The troops are armed, he says, with muskets, lances, bows and arrows, cimeters, and hangers. The council of state consists, by his account, of about forty ministers, to whom almost all the executive part of government is committed. He was once in the service of a *Tázir*, in whose train he went to see the fountains of the *Nile* or *Abey*, usually called *Alwey*, about eight days journey from *Gwender*. He saw three springs, one of which rises from the ground with a great noise, that may be heard at the distance of five or six miles. I showed him the description of the *Nile* by GREGORY of *Amhara*, which LUDOLF has printed in *Ethiopic*. He both read and explained it with great facility; whilst I compared his explanation with the *Latin* version, and found it perfectly exact. He asserted of his own accord, that the description was conformable to all that he had seen and heard in *Ethiopia*; and for that reason I annex it. When I interrogated him on the languages and learning of his country, he answered, that six or seven tongues at least were spoken there; that the most elegant idiom, which the king used, was the *Amharick*; that the *Ethiopic* contained, as it is well known, many *Arabick* words; that, besides,

their

then sacred books, as the prophecies of *Esau*, and others, they had Histories of *Abyssinia*, and various literary compositions; that their language was taught in schools and colleges, of which there were several in the metropolis. He said, that no *Abyssinian* doubted the existence of the royal prison called *Hahim*, situated on a very lofty mountain, in which the sons and daughters of their kings were confined; but that, from the nature of the thing, a particular description of it could not be obtained. “All these matters,” said he, are explained, I suppose, in the writings of *Yakub*, whom I saw thirteen years ago in *Gwenher*. He was a physician, and had attended the king’s brother, who was also a *Yazir*, in his last illness. The prince died; yet the king loved *Yakub*, and, indeed, all the court and people loved him. The king received him in his palace as a guest, supplied him with every thing that he could want; and, when he went to see the sources of the *Nile*, and other curiosities, (for he was extremely curious,) he received every possible assistance and accommodation from the royal favour. He understood the languages, and wrote and collected many books, which he carried with him.” It was impossible for me to doubt, (especially when he described the person of *Yakub*,) that he meant *JAMES BRUCE*, Esq. who travelled in the dress of a *Syrian* physician, and probably assumed with judgment a name well known in *Abyssinia*. He is still revered on *Mount Sinai* for his sagacity in discovering a spring, of which the monastery was in great need; he was known at *Jedda* by *Mr. MOHAMMED HUSSAIN*, one of the most intelligent *Mahomedans* in *India*; and I have seen him mentioned with great regard in a letter from an *Arabian* merchant at *Mokhá*. It is probable that he entered *Abyssinia* by the way of *Musuwwa*, a town in the possession of the *Muselmans*, and returned through the desert mentioned by *GREGORY* in his description of the *Nile*. We may hope that *Mr. BRUCE* will publish an account of his interesting travels,

with a version of the book of ENOCH, which no man but himself can give us with fidelity. By the help of *Abyssinian* records, great light may be thrown on the History of *Yemen* before the time of MUHAMMED; since it is generally known, that four *Ethiop* kings successively reigned in that country, having been invited over by the natives to oppose the tyrant DHU' NAWA's; and that they were, in their turn, expelled by the arms of the *Jimyarick* Princes, with the aid of ANUSHIRVAN, king of *Persia*, who did not fail, as it usually happens, to keep in subjection the people whom he had consented to relieve. If the annals of this period can be restored, it must be through the histories of *Abyssinia*, which will also correct the many errors of the best *Asiatick* writers on the *Nile*, and the countries which it fertilizes.

## ON THE COURSE OF THE NILE.

THE Nile, which the *Abyssinians* know by the names of *Abéy* and *Alawy*, or the *Giant*, gushes from several springs at a place called *Sucút*, lying on the highest part of *Dengalá*, near *Gojjám*, to the west of *Bayemdir*, and the lake of *Dara* or *Wed*; into which it runs with so strong and rapid a current, that it mixes not with the other waters, but rides or swims, as it were, above them.

All the rains that fall in *Abyssinia*, and descend in torrents from the hills, all streams and rivers, small and great, except the *Hanázó*, which washes the plains of *Hengút*, and the *Hawásh*, which flows by *Dewár* and *Fetgár*, are collected by this king of waters, and, like vassals, attend his march. Thus enforced, he rushes, like a hero exulting in his strength, and hastens to fertilize the land of *Egypt*, on which no rain falls. We must except also those *Ethiopian* rivers, which rise in countries bordering on the ocean, as the kingdoms of *Camlát*, *Guráyy*, *Wásy*, *Nanyah*, *Gasy*, *Weg*, and *Zinjiro*, whose waters are disembogued into the sea.

When the *Alawy* has passed the Lake, it proceeds between *Gojjám* and *Bayemdir*, and, leaving them to the west and east, pursues a direct course towards *Amhárá*, the skirts of which it bathes, and then turns again to the west, touching the borders of *Walaka*; whence it rolls along *Múgár* and *Shawai*, and, passing *Bazáwá* and *Gongá*, descends into the lowlands of *Shankila*, the country of the Blacks: thus it forms a sort of spiral round the province of *Gojjám*, which it keeps for the most part on its right.



Here it bends a little to the east, from which quarter, before it reaches the districts of *Sennár*, it receives two large rivers; one called *Tacazzy*, which runs from *Tegri*; and the other, *Gwangue*, which comes from *Dembeá*.

After it has visited *Sennár*, it washes the land of *Dongolá*, and proceeds thence to *Nubia*, where it again turns eastward, and reaches a country named *Atrim*, where no vessels can be navigated, by reason of the rocks and crags which obstruct the channel. The inhabitants of *Sennár* and *Nubia* may constantly drink of its water, which lies to the east of them like a strong bulwark; but the merchants of *Abyssinia*, who travel to *Egypt*, leave the *Nile* on their right, as soon as they have passed *Nubia*, and are obliged to traverse a desert of sand and gravel, in which for fifteen days they find neither wood nor water. They meet it again in the country of *Reís*, or *Upper Egypt*, where they find boats on the river, or ride on its banks, refreshing themselves with its salutary streams.

It is asserted by some travellers, that, when the *Alawy* has passed *Sennár* and *Dongolá*, but before it enters *Nubia*, it divides itself; that the great body of water flows entire into *Egypt*, where the smaller branch (the *Niger*) runs westward, not so as to reach *Barbary*, but towards the country of *Alwáh*, whence it rushes into the great sea. The truth of this fact I have verified, partly by my own observation, and partly by my inquiries among intelligent men; whose answers seemed the more credible, because, if so prodigious a mass of water were to roll over *Egypt* with all its wintry increase, not the land only, but the houses and towns, of the *Egyptians* must be overflowed.

## XXIII.

## ON THE TRIAL BY ORDEAL, AMONG THE HINDUS.

By ALI' IBRAHIM KHAN,

CHIEF MAGISTRATE AT BANARES.

COMMUNICATED BY WARREN HASTINGS, Esq.

THE modes of trying offenders by an appeal to the Deity, which are described at large in the *Mitácshérá*, or Comment on the *Dherma Sástra*, in the *Chapter of Oaths*, and other ancient books of *Hindu Law*, are here sufficiently explained, according to the interpretation of learned *Pandits*, by the well-wisher to mankind, ALI' IBRAHIM KHAN.

The word *Divya*, in *Sanscrit*, signifies the same with *Parícshá*, or *Parikhya*, in *Bhášhá*, *Kasam* in *Arabick*, and *Saucand* in *Persian*; that is, an *oath*; or the form of invoking the Supreme Being to attest the truth of an allegation; but it is generally understood to mean the trial by *ordeal*, or the form of appealing to the *immediate* interposition of the Divine Power.

Now this trial may be conducted in *nine* ways. First, by the *balance*; secondly, by *fire*; thirdly, by *water*; fourthly, by *poison*; fifthly, by the *Cósha*, or water in which an idol has been washed; sixthly, by *rice*; seventhly, by *boiling oil*; eighthly, by *red-hot iron*; ninthly, by *images*.

I. Ordeal by the *balance* is thus performed. The beam having been previously adjusted, the cord fixed, and both scales made perfectly even, the person accused and a *Pandit* fast a whole day; then, after the accused has been bathed in sacred water, the *hóma*, or *oblation*, presented

ed to *fire*, and the deities worshipped, he is carefully weighed ; and, when he is taken out of the scale, the *Pandits* prostrate themselves before it, pronounce a certain *mentra*, or *incantation*, agreeably to the *Sástras*, and, having written the substance of the accusation on a piece of paper, bind it on his head. Six minutes after they place him again in the scale ; and if he weigh more than before, he is held guilty ; if less, innocent ; if exactly the same, he must be weighed a third time ; when, as it is written in the *Mitáshera*, there will certainly be a difference in his weight. Should the balance, though well fixed, break down, this would be considered as a proof of his guilt.

II. For the *fire-ordeal* an excavation, nine hands long, two spans broad, and one span deep, is made in the ground, and filled with a fire of *pippal-wood* : into this the person accused must walk bare-footed ; and if his foot be unhurt, they hold him blameless ; if burned, guilty.

III. *Water-ordeal* is performed by causing the person accused to stand in a sufficient depth of water, either flowing or stagnant, to reach his navel ; but care should be taken that no ravenous animal be in it, and that it be not moved by much air : a *Bráhma*n is then directed to go into the water, holding a staff in his hand ; and a soldier shoots three arrows on dry ground from a bow of cane : a man is next dispatched to bring the arrow which has been shot farthest ; and, after he has taken it up, another is ordered to run from the edge of the water ; at which instant the person accused is told to grasp the foot or the staff of the *Bráhma*n, who stands near him in the water, and immediately to dive into it. He must remain under water till the two men who went to fetch the arrows are returned ; for if he raise his head or body  
above

above the surface before the arrows are brought back, his guilt is considered as fully proved. In the villages near *Benáres*, it is the practice for the person, who is to be tried by this kind of *ordeal*, to stand in water up to his navel, and then, holding the foot of a *Bráhmaṇ*, to dive under it as long as a man can walk fifty paces very gently. If before the man has walked thus far the accused rise above the water, he is condemned; if not, acquitted.

IV. There are two sorts of trial by *poison*. First, the *Pandits* having performed their *hóma*, and the person accused his ablution, two *retti's* and a half, or seven barley-corns, of *ṛishanága*, a poisonous root, or of *sanc'hyá*, (that is, white arsenick,) are mixed in eight *másha's*, or sixty-four *retti's*, of clarified *butter*, which the accused must eat from the hand of a *Bráhmaṇ*: if the poison produce no visible effect, he is absolved; otherwise, condemned. Secondly, the hooded snake, called *nága*, is thrown into a deep earthen pot, into which is dropped a ring, a seal, or a coin: this the person accused is ordered to take out with his hand; and if the serpent bite him, he is pronounced guilty; if not, innocent.

V. Trial by the *Cósha* is as follows. The accused is made to drink three draughts of the water in which the images of the *Sun*, of *Dévi*, and other Deities, have been washed for that purpose; and if within fourteen days he has any sickness or indisposition, his crime is considered as proved.

VI. When several persons are suspected of theft, some dry rice is weighed with the sacred stone called *salgram*; or certain *slócas* are read over it; after which the suspected persons are severally ordered to chew  
a quantity

a quantity of it : as soon as they have chewed it, they are to throw it on some leaves of *pippal*, or, if none be at hand, on some *b'húrja patra*, or bark of a tree from *Nepál* or *Cashmír*. The man from whose mouth the rice comes dry, or stained with blood, is holden guilty ; the rest are acquitted.

VII. The ordeal by *hot oil* is very simple : when it is heated sufficiently, the accused thrusts his hand into it ; and if he be not burned is held innocent.

VIII. In the same manner they make an *iron ball*, or the *head of a lance*, red-hot, and place it in the hands of the person accused ; who, if it burn him not, is judged guiltless.

IX. To perform the ordeal by *dharmúrch*, which is the name of the *slóca* appropriated to this mode of trial, either an image, named *Dharma*, or the Genius of Justice, is made of silver, and another, called *Adharma*, of clay or iron, both of which are thrown into a large earthen jar, and the accused, having thrust his hand into it, is acquitted if he bring out the silver image, but condemned if he draw forth the iron. Or, the figure of a deity is painted on white cloth, and another on black ; the first of which they named *Dharma*, and the second *Adharma* : these are severally rolled up in cow-dung, and thrown into a large jar, without having ever been shown to the accused ; who must put his hand into the jar, and is acquitted or convicted, as he draws out the figure on white or on black cloth.

It is written in the comment on the *Dharma Sástra*, that each of the  
four

four principal casts has a sort of ordeal appropriated to it; that a *Bráhmén* must be tried by the *balance*, a *Cshatriya* by *fire*, a *Vaisya* by *water*, and a *Súdra* by *poison*: but some have decided that any ordeal, except that by *poison*, may be performed by a *Bráhmén*, and that a man of any cast may be tried by the *balance*. It has been determined, that a woman may have any trial except those by *poison* and by *water*.

Certain months and days also are limited in the *Mitácshera* for the different species of ordeal; as *Agrahan*, *Paush*, *Mágh*, *P'hálgun*, *Sráwan*, and *B'hádr*, for that by *fire*; *A'swin*, *Cártic*, *Jaisht*, and *A'shaáh*, for that by *water*; *Paush*, *Mágh*, and *P'hálgun*, for that by *poison*; and regularly there should be no *water-ordeal* on the *Ashtmei*, or *eighth*; the *Cheturdasi*, or *fourteenth*, day of the new or full moon, in the intercalary month, in the month of *B'hádr*, on *Sanaischer*, or *Saturday*, and on *Mangal*, or *Tuesday*: but, whenever the magistrate decides that there shall be an ordeal, the regular appointment of months and days needs not be regarded.

The *Mitácshera* contains also the following distinctions: in cases of theft or fraud to the amount of a *hundred* gold mohrs, the trial by *poison* is proper; if *eighty* mohrs be stolen, the suspected person may be tried by *fire*; if *forty*, by the *balance*; if from *thirty* to *ten*, by the *image-water*; if two only, by *rice*.

An inspired legislator, named *Cátyáyana*, was of opinion, that, though a theft or fraud could be proved by witnesses, the party accused might be tried by ordeal. He says too, that, where a thousand *pana's* are stolen or fraudulently with-held, the proper trial is by *poison*; where *seven hundred and fifty*, by *fire*; where *six hundred and sixty-six*, and a fraction, by

water ; where *five hundred*, by the *balance* ; where *four hundred*, by *hot oil* ; where *three hundred*, by *rice* ; where an *hundred and fifty*, by the *Cósha* ; and where *one hundred*, by the *dharmárech*, or images of silver and iron.

The mode of conduſting the ordeal by red hot *balls*, or *heads of ſpears*, is thus particularly deſcribed in the commentary on *Yágyawelcya*.

At day-break the place where the ceremony is to be performed is cleared and waſhed in the cuſtomary form ; and, at ſun-riſe, the *Pandits* having paid their adoration to GANÉSA, the God of Wiſdom, draw nine circles on the ground with cow-dung, at intervals of ſixteen fingers ; each circle containing ſixteen fingers of earth, but the ninth either ſmaller or larger than the reſt. Then they worſhip the deities in the mode preſcribed by the *Sáſtra*, preſent oblations to the fire, and, having a ſecond time worſhipped the Gods, read the appointed *mentra's*. The perſon to be tried then performs an ablution, puts on moiſt clothes, and, turning his face to the eaſt, ſtands in the *ſiſt* ring, with both his hands fixed in his girdle. After this the preſiding magiſtrate and *Pandits* order him to rub ſome rice in the huſk between his hands, which they carefully inſpect ; and, if the ſcar of a former wound, a mole, or other mark appear on either of them, they ſtain it with a dye, that, after the trial, it may be diſtinguiſhed from any new mark. They next order him to hold both his hands open and cloſe together ; and, having put into them ſeven leaves of the *trembling tree*, or *pippal*, ſeven of the *sami* or *jend*, ſeven blades of *dartha* graſs, a little barley moiſtened with curds, and a few flowers, they faſten the leaves on his hand with ſeven threads of raw cotton. The *Pandits* then read the *ślokas* which are appointed for the occaſion ; and, having

written

written a slate of the case and the point in issue on a Palmyra leaf, together with the *mentra* prescribed in the *Vēda*, they tie the leaf on the head of the accused. All being prepared, they heat an iron ball or the head of a lance, weighing two *ser* and a half, or five *pounds*, and throw it into water; they heat it again, and again cool it in the same manner: the third time they keep it in the fire till it is red hot; then they make the person accused stand in the first circle; and, having taken the iron from the fire, and read the usual incantation over it, the *Pandits* place it with tongs in his hands. He must step gradually from circle to circle, his feet being constantly within one of them, and, when he has reached the *eighth*, he must throw the iron into the *ninth*, so as to burn some grass, which must be left in it for that purpose. This being performed, the magistrate and *Pandits* again command him to rub some rice in the husk between both his hands, which they afterwards examine; and if any mark of burning appear on either of them, he is convicted; if not, his innocence is considered as proved. If his hand shake through fear, and by his trembling any other part of his body is burned, his veracity remains unimpeached; but, if he let the iron drop before he reach the *eighth* circle, and doubt arise in the minds of the spectators, whether it had burned him, he must repeat the whole ceremony from the beginning.

In the year of the MESSIAH 1783, a man was tried by the *hot ball* at *Benâres*, in the presence of me ALI IBRA'HIM KHA'N, on the following occasion. A man had appealed one SANCAR of larceny, who pleaded that he was not guilty; and as the theft could not be proved by legal evidence, the trial by fire-ordeal was tendered to the appellee, and accepted by him. This well-wisher to mankind advised the learned magistrates and *Pandits* to prevent the decision of the question by a mode not conformable to the



practice of the Company's Government, and recommended an oath by the water of the *Ganges* and the leaves of *tulasi* in a little vessel of brass, or by the book *Herivansa*, or the stone *Sálgrám*, or by the hallowed ponds or basins; all which oaths are used at *Benáres*. When the parties obstinately refused to try the issue by any one of the modes recommended, and insisted on a trial by the hot ball, the magistrates and *Pandits* of the court were ordered to gratify their wishes, and, setting aside those forms of trial in which there could be only a distant fear of death, or loss of property, as the just punishment of perjury by the sure, yet slow, judgment of heaven, to perform the ceremony of ordeal agreeably to the *Dherma Sástra*; but it was not till after mature deliberation for four months, that a regular mandate issued for a trial by the red hot ball; and this was at length granted for four reasons: first, because there was no other way of condemning or absolving the person accused; secondly, because both parties were *Hindus*, and this mode of trial was specially appointed in the *Dherma Sástra* by the ancient lawgivers; thirdly, because this ordeal is practised in the dominions of the *Hindu Rájás*; and fourthly, because it might be useful to inquire how it was possible for the heat of fire to be resisted, and for the hand that held it to avoid being burned. An order was accordingly sent to the *Pandits* of the court and of *Benáres* to this effect: "Since the  
 " parties accusing and accused are both *Hindus*, and will not consent to  
 " any trial but that by the hot ball, let the ordeal desired be duly per-  
 " formed in the manner prescribed by the *Mitácshera*, or commentary on  
 " *YA'GYAWALKYA*."

When preparations were made for the trial, this well-wisher to mankind, attended by all the learned professors, by the officers of the court, the *Sipáhis* of Captain HOGAN's battalion, and many inhabitants of *Bená-*

*res,*

res, went to the place prepared, and endeavoured to dissuade the appellor from requiring the accused to be tried by fire, adding, "if his hand be not burned, you shall certainly be imprisoned." The accuser, not deterred by this menace, persisted in demanding the trial. The ceremony, therefore, was thus conducted in the presence of me ALI IBRAHIM KHAN.

The *Pandits* of the court and the city, having worshipped the God of Knowledge, and presented their oblation of clarified butter to the fire, formed nine circles of cow-dung on the ground; and, having bathed the appellee in the *Ganges*, brought him with his clothes wet; when to remove all suspicion of deceit, they washed his hands with pure water: then, having written a state of the case and the words of the *mentra* on a Palmyra-leaf, they tied it on his head; and put into his hands, which they opened and joined together, seven leaves of *pippal*, seven of *jend*, seven blades of *dartha* grass, a few flowers, and some barley moistened with curds, which they fastened with seven threads of raw white cotton. After this they made the iron ball red hot, and, taking it up with tongs, placed it in his hands. He walked with it, step by step, the space of three *gaz* and a half, through each of the seven intermediate rings, and threw the ball into the *ninth*, where it burnt the grass, that had been left in it. He next, to prove his veracity, rubbed some rice in the husk between his hands; which were afterwards examined, and were so far from being burned, that not even a blister was raised on either of them. Since it is the nature of fire to burn, the officers of the court, and people of *Benáres*, near five hundred of whom attended the ceremony, were astonished at the event; and this well-wisher to mankind was perfectly amazed. It occurred to his weak apprehension, that probably the fresh leaves, and other things, which, as it had been mentioned, were placed on the hands of the accused, had prevented their being burned; besides that the

time

time was but short between his taking the ball and throwing it down; yet it is positively declared in the *Dharma Sastra*, and in the written opinions of the most respectable *Pandits*, that the hand of a man who speaks truth cannot be burned; and ALL IBB VEHM KHA'N certainly saw with his own eyes, as many others also saw with theirs, that the hands of the appellee in this cause were unhurt by the fire. He was consequently discharged; but, that men might in future be deterred from demanding the trial by ordeal, the appellor was committed for a week. After all, if such a trial could be seen once or twice by several intelligent men, acquainted with natural philosophy, they might be able to assign the true reason why a man's hand may be burned in some cases, and not in others.

Ordeal by the vessel of hot oil, according to the comment on the *Dharma Sastra*, is thus performed. The ground appointed for the trial is cleared and rubbed with cow-dung; and the next day, at sun-rise, the *Pandit* worships GANE'SA, presents his oblations, and pays adoration to other deities, conformably to the *Sastra*: then, having read the incantation prescribed, he places a round pan of gold, silver, copper, iron, or clay, with a diameter of sixteen fingers, and four fingers deep; and throws into it one *ser*, or eighty *sicca* weight, of clarified butter, or oil of *sesamum*. After this a ring of gold, or silver, or iron, is cleaned and washed with water, and cast into the oil, which they proceed to heat; and, when it is very hot, put into it a fresh leaf of *pippala*, or of *bilwa*: when the leaf is burned, the oil is known to be sufficiently hot. Then, having pronounced a *mentra* over the oil, they order the party accused to take the ring out of the pan; and if he take it out without being burned, or without a blister on his hand, his innocence is considered as proved; if not, his guilt.

A *Bráhma*n,

A *Brahman*, named RISHI'SWARA BHATTA, accused one RA'MDAYA'L, a linen painter, of having stolen his goods. RA'MDAYA'L pleaded not guilty; and, after much altercation, consented to be tried, as it had been proposed, by the vessel of oil. This well-wisher to mankind advised the *Pandits* of the court to prevent, if possible, that mode of trial, but, since the parties insisted on it, an ordeal by hot oil, according to the *Sastra*, was awarded for the same reasons which prevailed in regard to the trial by the ball. The *Pandits*, who assisted at the ceremony, were BHISHMA BHATTA, NA'NA'PA'GHAC, MANIRA'MA Pât'haca, MENIRA'MA BHATTA, SIVA, ANANTARA'MA BHATTA, CRIPA'RA'MA, VINNUHRI, CRISHNACHANDRA, RA'ME'NDRA, GO'VINDARA'MA, HIRICRISHNA BHATTA, CA'LIDA'SA: the three last were *Pandits* of the court. When GANESA had been worshipped, and the *homa* presented, according to the *Sastra*, they sent for this well-wisher to mankind; who, attended by the two *Daróghas* of the *Diváni* and *Faujdarí* courts, the *Cotwal* of the town, the other officers of the court, and most of the inhabitants of *Benares*, went to the place of trial; where he laboured to dissuade RA'MDAYA'L and his father from submitting to the ordeal; and apprized them, that, if the hand of the accused should be burned, he would be compelled to pay the value of the goods stolen, and his character would be disgraced in every company. RA'MDAYA'L would not desist. he thrust his hand into the vessel, and was burned. The opinion of the *Pandits* was then taken; and they were unanimous, that, by the burning of his hand, his guilt was established, and he bound to pay RISHI'SWARA BHATTA the price of what he had stolen; but if the sum exceeded five hundred *ashuqi's*, his hand must be cut off by an express law in the *Sastra*; and a mulct also must be imposed on him according to his circumstances.

The chief magistrate, therefore, caused RA'MDAYA'L to pay RISHI'SWARA seven hundred rupees, in return for the goods which had been stolen; but, as amercements in such cases are not usual in the courts of judicature at Benáres, the mulct was remitted, and the prisoner discharged.

The record of this conviction was transmittted to *Calcutta* in the year of the MESSIAH 1783; and in the month of *April*, 1784, the Governor General, IMA'DU'DDAU'LAH JELA'DET JANG BEHA'DER, having seen the preceding account of trials by ordeal, put many questions concerning the meaning of *Sanscrit* words, and the cases here reported; to which he received respectful answers. He first desired to know the precise meaning of *hóma*, and was informed that it meant the oblations made to please the deities, and comprised a variety of things. Thus in the *agni hóma*, they throw into the fire several sorts of wood and grafs, as *palás* wood, *chadira* wood, *racta chandan* or red sandal, *pippal*-wood *sami*, and *cusha* grafs, together with some sorts of grain, fruit and other ingredients, as *black sesamum*, *barley*, *rice*, *sugar-cane*, *clarified butter*, *almonds*, *dates*, and *gúgal* or *bdellium*. To his next question, "how many species of *hóma* there were," it was answered, that different species were adapted to different occasions: but that, in the ordeals by hot iron, and hot oil, the same sort of oblation was used. When he desired to know the meaning of the word *mentra*, he was respectfully told, that in the language of the *Pandits* there were three such words, *mentra*, *yantra*, and *tantra*; that the *first* meant a passage from one of the *Védas*, in which the names of certain deities occurred; the *second*, a scheme of figures, which they write with a belief that their wishes will be accomplished by it; and the *third*, a medical preparation, by the use of which all injuries may be avoided: for they are said to rub it on their hands, and afterwards to touch

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red hot iron without being burned. He then asked how much barley, moistened with curds, was put into the hands of the accused person; and the answer was, *nine grains*.

His other questions were thus answered: "That the leaves of *pippala* were spread about in the hands of the accused, not heaped one above another; that the man, who performed the fire-ordeal, was not much agitated, but seemed in full possession of his faculties; that the person tried by hot oil was at first afraid, but persisted, after he was burned, in denying the theft; nevertheless, as he previously had entered into a written agreement, that, if his hand should be hurt, he would pay the value of the goods, the magistrate for that reason thought himself justified in compelling payment; that, when the before-mentioned ingredients of the *homa* were thrown into the fire, the *Pandits*, sitting round the ~~the~~ *hearth*, sung the *Ślōcas* prescribed in the *Sāstra*. That the form of the *hearth* is established in the *Ṛ̥da* and in the *Dharma Sāstra*; and this fire-place is also called *Ṭedi*; that, for the smaller oblations, they raise a little ground for the *hearth*, and kindle fire on it; for the higher oblations, they sink the ground to receive the fire, where they perform the *homa*; and this sacred *hearth* they call *cunda*." The governor then asked, why the trials by fire, by the hot ball, and the vessel of oil, if there be no essential difference between them, are not all called fire-ordeals; and it was humbly answered, that, according to some *Pandits*, they were all three different; whilst others insisted, that the trial by fire was distinct from that by the vessel, though the trial by the hot ball and the head of a lance were the same; but, that, in the apprehension of his respectful servant, they were all ordeals *by fire*.

## THE INDIAN LAW OF ORDEAL,

*Verbally translated from YAGYAWALKYA.*

1. **T**HE balance, fire, water, poison, the idol—these are the ordeals used here below for the proof of innocence, when the accusations are heavy, and when the accuser offers to hazard a mulct, (if he should fail) :

2. Or one party may be tried, if he please, by ordeal, and the other must then risque an amercement. But the trial may take place even without any wager, if the crime committed be injurious to the prince.

3. The sovereign, having summoned the accused, while his clothes are yet moist from bathing, at sunrise, before he has broken his fast, shall cause all trials by ordeal to be conducted in the presence of *Bráhmans*.

4. The balance is for women, children, old men, the blind, the lame, *Bráhmans*, and the sick ; for the *Súdra*, fire or water, or seven barley-corns of poison.

5. Unless the loss of the accuser amount to a thousand pieces of silver, the accused must not be tried by the red hot ball, nor by poison, nor by the scales ; but if the offence be against the king, or if the crime be heinous, he must acquit himself by one of those trials in all cases.

6. He who has recourse to the balance, must be attended by persons experienced in weighing, and go down into one scale, with an equal weight placed in the other, and a groove (with water in it) marked on the beam.

7. " Thou

7. "Thou, O balance, art the mansion of truth; thou wast anciently contrived by deities: declare the truth, therefore, O giver of success, and clear me from all suspicion.

8. "If I am guilty, O venerable as my own mother, then sink me down but if innocent raise me aloft." Thus shall he address the balance.

9. If he sink, he is convicted, or if the scales be broken; but if the string be not broken, and he rise aloft, he must be acquitted.

10. On the trial by fire, let both hands of the accused be rubbed with rice in the husk, and well examined: then let seven leaves of the *Aswattha* (the religious fig-tree) be placed on them, and bound with seven threads.

11. "Thou, O fire, pervadest all beings; O cause of purity, who givest evidence of virtue and of sin, declare the truth in this my hand."

12. When he has pronounced this, the priest shall place in both his hands an iron ball, red hot, and weighing fifty *pala*'s\*

13. Having taken it, he shall step gradually into seven circles, each with a diameter of sixteen fingers, and separated from the next by the same space.

14. If, having cast away the hot ball, he shall again have his hands rubbed with rice in the husk, and shall show them unburned, he will prove his innocence. Should the iron fall during the trial, or should a doubt arise (on the regularity of the proceedings) he must be tried again.

\* A *pala* is four *carsha*'s, and a *carsha*, eighty *radica*'s, or seeds of the *Gurja* creeper, each weighing above a grain and a quarter or, correctly,  $1\frac{1}{8}$  gr.



15. " Preserve me, O, VARUNA, by declaring the truth." Thus having invoked the god of waters, the accused shall plunge his head into the river or pool, and hold both thighs of a man, who shall stand in it up to his navel :

16. A swift runner shall then hasten to fetch an arrow shot at the moment of his plunging ; and if, while the runner is gone, the priest shall see the head of the accused under water, he must be discharged as innocent.

17. " Thou, O poison, art the child of BRAHMA', steadfast in justice and " in truth : clear me then from this heavy charge, and, if I have spoken truly, " become nectar to me."

18. Saying this, he shall swallow the poison *Sārṅga*, from the tree which grows on the mountain *Himālaya* ; and if he digest it without any inflammation, the prince shall pronounce him guiltless.

19. Or the priest shall perform rites to the image of some tremendous deity, and, having bathed the idol, shall make the accused to drink three handfuls of the water, that has dropped from it :

20. If, in fourteen days after, he suffer no dreadful calamity from the act of the deity or of the king, he must indubitably be acquitted.

## XXIV.

## THE SECOND

## ANNIVERSARY DISCOURSE,

DELIVERED 24th FEBRUARY, 1785.

BY THE PRESIDENT.

GENTLEMEN,

IF the Deity of the *Hindus*, by whom all their just requests are believed to be granted with singular indulgence, had proposed last year to gratify my warmest wishes, I could have desired nothing more ardently than the success of your institution; because I can desire nothing in preference to the general good, which your plan seems calculated to promote, by bringing to light many useful and interesting tracts, which, being too short for separate publication, might lie many years concealed, or, perhaps, irrecoverably perish. My wishes are accomplished, without an invocation to CA'MADHE'NU; and your Society, having already passed its infant state, is advancing to maturity with every mark of a healthy and robust constitution. When I reflect, indeed, on the variety of subjects which have been discussed before you, concerning the history, laws, manners, arts, and antiquities of *Asia*, I am unable to decide whether my pleasure or my surprise be the greater; for I will not dissemble, that your progress has far exceeded my expectations: and, though we must seriously deplore the loss of those excellent men who have lately departed from this capital, yet, there is a prospect still of large contributions to your stock of *Asiatick* learning,

learning, which, I am persuaded, will continually increase. My late journey to *Benâres* has enabled me to assure you, that many of your members, who reside at a distance, employ a part of their leisure in preparing additions to your archives; and, unless I am too sanguine, you will soon receive light from them on several topicks entirely new in the republic of letters.

It was principally with a design to open sources of such information, that I long had meditated an expedition up the *Ganges* during the suspension of my business; but although I had the satisfaction of visiting two ancient seats of *Hindu* superstition and literature, yet, illness having detained me a considerable time in the way, it was not in my power to continue in them long enough to pursue my inquiries; and I left them, as *ÆNEAS* is feigned to have left the shades, when his guide made him recollect *the swift flight of irrevocable time*, with a curiosity raised to the height, and a regret not easy to be described.

Whoever travels in *Asia*, especially if he be conversant with the literature of the countries through which he passes, must naturally remark the superiority of *European* talents. The observation, indeed, is at least as old as *ALEXANDER*; and, though we cannot agree with the sage preceptor of that ambitious Prince, that “the *Asiatics* are born to be slaves,” yet the *Athenian* poet seems perfectly in the right, when he represents *Europe* as a sovereign Princess, and *Asia* as her Handmaid: but, if the mistress be transcendently majestic, it cannot be denied that the attendant has many beauties, and some advantages peculiar to herself. The ancients were accustomed to pronounce *panegyrics* on their own countrymen at the expense of all other nations; with a political view, perhaps, of stimulating

stimulating them by praise, and exciting them to still greater exertions; but such arts are here unnecessary; nor would they, indeed, become a Society, who seek nothing but truth unadorned by rhetorick: and, although we must be conscious of our superior advancement in all kinds of useful knowledge, yet we ought not therefore to condemn the people of *Asia*, from whose researches into nature, works of art, and inventions of fancy, many valuable hints may be derived for our own improvement and advantage. If that, indeed, were not the principal object of your institution, little else could arise from it, but the mere gratification of curiosity; and I should not receive so much delight from the humble share which you have allowed me to take in promoting it.

To form an exact parallel between the works and actions of the Western and Eastern Worlds, would require a tract of no inconsiderable length; but we may decide, on the whole, that reason and taste are the grand prerogatives of *European* minds, while the *Asiatics* have soared to loftier heights in the sphere of imagination. The civil history of their vast empires, and of *India* in particular, must be highly interesting to our common country: but we have a still nearer interest in knowing all former modes of ruling *these inestimable provinces*, on the prosperity of which so much of our national welfare, and individual benefit, seems to depend. A minute geographical knowledge, not only of *Bengal* and *Bahar*, but, for evident reasons, of *all the kingdoms bordering on them*, is closely connected with an account of their many revolutions: but the *natural* productions of these territories, especially in the *vegetable* and *mineral* systems, are momentous objects of research to an *imperial*, but, which is a character of equal dignity, a *commercial* people.

If *botany* may be described by metaphors drawn from the science itself, we may justly pronounce a minute acquaintance with *plants*, their *classes*, *orders*, *kinds*, and *species*, to be its *flowers*, which can only produce *fruit* by an application of that knowledge to the purposes of life, particularly to *diet*, by which diseases may be avoided; and to *medicine*, by which they may be remedied: for the improvement of the last mentioned art, than which none surely can be more beneficial to mankind, the virtues of *minerals* also should be accurately known. So highly has medical skill been prized by the ancient *Indians*, that one of the *fourteen Retna's*, or *precious things*, which their Gods are believed to have produced by churning the ocean with the mountain *Mandara*, was a *learned physician*. What their old books contain on this subject, we ought certainly to discover, and that without loss of time; lest the venerable, but abstruse, language, in which they are composed, should cease to be perfectly intelligible, even to the best educated natives, through a want of powerful invitation to study it. BERNIER, who was himself of the faculty, mentions approved medical books in *Sanscrit*, and cites a few aphorisms, which appear judicious and rational; but we can expect nothing so important from the works of *Hindu* or *Muselman* physicians, as the knowledge, which experience must have given them, of *simple* medicines. I have seen an *Indian* prescription of *fifty-four*, and another of *sixty-six*, ingredients; but such compositions are always to be suspected, since the effect of one ingredient may destroy that of another, and it were better to find certain accounts of a single leaf or berry, than to be acquainted with the most elaborate compounds, unless they too have been proved by a multitude of successful experiments. The noble deobstruent oil, extracted from the *eranda* nut, the whole family of *Balsams*, the incomparable stomachick root from *Columbo*, the fine astringent ridiculously

diculouſly called *Japan* earth, but in truth produced by the decoction of an *Indian* plant, have long been uſed in *Asia*; and who can foretel what glorious diſcoveries of other oils, roots, and ſalutary juices, may be made by your Society? If it be doubtful whether the *Peruvian* bark be *always* efficacious in this country, its place may, perhaps, be ſupplied by ſome indigenous vegetable equally antiſeptic, and more congenial to the climate. Whether any treatiſes on *Agriculture* have been written by experienced natives of theſe provinces, I am not yet informed; but ſince the court of *Spain* expect to find uſeful remarks in an *Arabick* tract preſerved in the *Eſcurial*, on the cultivation of land in that kingdom, we ſhould inquire for ſimilar compoſitions, and examine the contents of ſuch as we can procure.

The ſublime ſcience of Chymiſtry, which I was on the point of calling *divine*, muſt be added, as a key to the richeſt treaſuries of nature; and it is impoſſible to foreſee how greatly it may improve our *manufactures*, eſpecially if it can fix thoſe brilliant *dyes*, which want nothing of perfect beauty but a longer continuance of their ſplendour; or how far it may lead to new methods of *fluxing and compounding metals*, which the *Indians*, as well as the *Chinese*, are thought to have pracliſed in higher perfection than ourſelves.

In thoſe elegant arts, which are called *fine* and *liberal*, though of leſs general utility than the labours of the mechanick, it is really wonderful how much a ſingle nation has excelled the whole world: I mean the ancient *Greeks*, whoſe *ſculpture*, of which we have exquisite remains, both on gems and in marble, no modern tool can equal; whoſe *architecture* we can only imitate at a ſervile diſtance, but are unable to make one ad-

dition to it, without destroying its graceful simplicity; whose *poetry* still delights us in youth, and amuses us at a maturer age; and of whose *painting* and *musick* we have the concurrent relations of so many grave authors, that it would be strange incredulity to doubt their excellence. *Painting*, as an art belonging to the powers of the imagination, or what is commonly called *Genius*, appears to be yet in its infancy among the people of the east: but the *Hindu* system of *musick* has, I believe, been formed on truer principles than our own; and all the skill of the native composers is directed to the great object of their art, *the natural expression of strong passions*, to which *melody*, indeed, is often sacrificed; though some of their tunes are pleasing even to an *European* ear. Nearly the same may be truly asserted of the *Arabian* or *Persian* system; and, by a correct explanation of the best books on that subject, much of the old *Grecian* theory may probably be recovered.

The *poetical* works of the *Arabs* and *Persians*, which differ surprisingly in their style and form, are here pretty generally known; and, though tastes, concerning which there can be no disputing, are divided in regard to their merit, yet we may safely say of them, what *ABULFAZL* pronounces of the *Mahábhárat*, that, "although they abound with extravagant images and descriptions, they are in the highest degree entertaining and instructive." Poets of the greatest genius, *PINDAR*, *ÆSCHYLUS*, *DANTE*, *PETRARCA*, *SHAKESPEAR*, *SPENSER*, have most abounded in images not far from the brink of absurdity; but, if their luxuriant fancies, or those of *ABULOLA*, *FIRDAUSI*, *NIZA'MI*, were pruned away at the hazard of their strength and majesty, we should lose many pleasures by the amputation. If we may form a just opinion of the *Sanscrit* poetry from the specimens already exhibited, (though we can only judge perfectly by consulting

consulting the originals,) we cannot but thirst for the whole work of VYA'SA, with which a member of our Society, whose presence deters me from saying more of him, will in due time gratify the publick. The poetry of *Mathurá*, which is the *Parnassian* land of the *Hindus*, has a softer and less elevated strain; but, since the inhabitants of the districts near *Agra*, and principally of the *Duab*, are said to surpass all other *Indians* in eloquence, and to have composed many agreeable tales and love-songs, which are still extant, the *Bhášhá*, or *vernacular idiom* of *Vraja*, in which they are written, should not be neglected. No specimens of genuine *oratory* can be expected from nations, among whom the form of government precludes even the idea of *popular eloquence*; but the art of writing, in elegant and modulated periods, has been cultivated in *Asia* from the earliest ages: the *Véda's*, as well as the *Alkhoran*, are written in measured prose; and the compositions of *ISOCRATES* are not more highly polished than those of the best *Arabian* and *Persian* authors.

Of the *Hindu* and *Muselman* architecture there are yet many noble remains in *Bahar*, and some in the vicinity of *Malda*; nor am I unwilling to believe, that even those ruins, of which you will, I trust, be presented with correct delineations, may furnish our own architects with new ideas of beauty and sublimity.

Permit me now to add a few words on the *sciences*, properly so named; in which it must be admitted, that the *Asiatics*, if compared with our western nations, are mere children. One of the most sagacious men in this age, who continues, I hope, to improve and adorn it, SAMUEL JOHNSON, remarked in my hearing, that, "if NEWTON had flourished in ancient *Greece*, he would have been worshipped as a divi-



"nity:" how zealously then would he be adored in *Hindustan*, if his incomparable writings could be read and comprehended by the *Pandits* of *Cashmír* or *Benares*! I have seen a mathematical book in *Sanscrit* of the highest antiquity; but soon perceived from the diagrams, that it contained only simple elements: there may, indeed, have been, in the favourable atmosphere of *Asia*, some diligent observers of the celestial bodies; and such observations as are recorded should indisputably be made publick; but let us not expect any new *methods*, or the analysis of new *curves*, from the geometricians of *Iran*, *Turkistan*, or *India*. Could the works of ARCHIMEDES, the NEWTON of *Sicily*, be restored to their genuine purity by the help of *Arabick* versions, we might then have reason to triumph on the success of our scientific inquiries; or could the successive improvements and various rules of *Algebra* be traced through *Arabian* channels, to which CARDAN boasted that he had access, the modern history of *Mathematicks* would receive considerable illustration.

The jurisprudence of the *Hindus* and *Muselmans* will produce more immediate advantage; and, if some standard *law-tracts* were accurately translated from the *Sanscrit* and *Arabick*, we might hope in time to see so complete a digest of *Indian Laws*, that all disputes among the natives might be decided without *uncertainty*, which is, in truth, a disgrace, though satirically called a *glory*, to the forensick science.

All these objects of inquiry must appear to you, Gentlemen, in so strong a light, that bare intimations of them will be sufficient; nor is it necessary to make use of *emulation* as an incentive to an ardent pursuit of them: yet I cannot forbear expressing a wish, that the activity of the *French* in the same pursuits may not be superior to ours; and that the researches

searches of M. SONNERAT, whom the court of *Versailles* employed for seven years in these climates, merely to collect such materials as we are seeking, may kindle, instead, of abating, our own curiosity and zeal. If you assent, as I flatter myself you do, to these opinions, you will also concur in promoting the object of them; and a few ideas having presented themselves to my mind, I presume to lay them before you, with an entire submission to your judgment.

No contributions, except those of the literary kind, will be requisite for the support of the Society; but if each of us were occasionally to contribute a succinct description of such manuscripts as he had perused or inspected, with their dates and the names of their owners, and to propose for solution such *questions* as had occurred to him concerning *Asiatick Art, Science, and History*, natural or civil, we should possess without labour, and almost by imperceptible degrees, a fuller catalogue of oriental books, than has hitherto been exhibited; and our correspondents would be apprised of those points to which we chiefly direct our investigations. Much may, I am confident, be expected from the communications of *learned natives*, whether lawyers, physicians, or private scholars, who would eagerly, on the first invitation, send us their *Mekamát* and *Risálahs* on a variety of subjects: some for the sake of advancing general knowledge, but most of them from a desire, neither uncommon nor unreasonable, of attracting notice, and recommending themselves to favour. With a view to avail ourselves of this disposition, and to bring their latent science under our inspection, it might be advisable to print and circulate a short memorial, in *Persian* and *Hindi*, setting forth, in a style accommodated to their own habits and prejudices, the design of our institution; nor would it be impossible hereafter, to give a medal annually, with inscriptions,

scriptions, in *Persian* on one side, and on the reverse in *Sanscrit*, as the prize of merit, to the writer of the best essay or dissertation. To instruct others is the prescribed duty of learned *Bráhmans*, and if they be men of substance, without reward; but they would all be flattered with an honorary mark of distinction; and the *Mahomedans* have not only the permission, but the positive command, of their law-giver, *to search for learning even in the remotest parts of the globe*. It were superfluous to suggest, with how much correctness and facility their compositions might be translated for our use, since their languages are now more generally and perfectly understood than they have ever been by any nation of *Europe*.

I have detained you, I fear, too long by this address, though it has been my endeavour to reconcile comprehensiveness with brevity. The subjects, which I have lightly sketched, would be found, if minutely examined, to be inexhaustible; and, since no limits can be set to your researches but the boundaries of *Asia* itself, I may not improperly conclude with wishing for your society, what the Commentator on the Laws prays for the constitution of our country, that IT MAY BE PERPETUAL.

## XXV.

## THE THIRD

## ANNIVERSARY DISCOURSE,

DELIVERED 2d FEBRUARY, 1786.

BY THE PRESIDENT.

**I**N the former discourses, which I had the honour of addressing to you, Gentlemen, on the *institution* and *objects* of our Society, I confined myself purposely to general topics; giving in the first a distant prospect of the vast career on which we were entering; and, in the second, exhibiting a more diffuse, but still superficial, sketch of the various discoveries in History, Science, and Art, which we might justly expect from our inquiries into the Literature of *Asia*. I now propose to fill up that outline so comprehensively as to omit nothing essential, yet so concisely as to avoid being tedious; and, if the state of my health shall suffer me to continue long enough in this climate, it is my design, with your permission, to prepare for our annual meetings a series of short dissertations, unconnected in their titles and subjects, but all tending to a common point of no small importance in the pursuit of interesting truths.

Of all the works which have been published in our own age, or, perhaps, in any other, on the History of the Ancient World, and the *first*  
*population*

population of this habitable globe, that of Mr. JACOB BRYANT, whom I name with reverence and affection, has the best claim to the praise of deep erudition ingeniously applied, and new theories happily illustrated, by an assemblage of numberless converging rays from a most extensive circumference: it falls, nevertheless, as every human work must fall, short of perfection; and the least satisfactory part of it seems to be that which relates to the derivation of words from *Asiatick* languages. Etymology has, no doubt, some use in historical researches; but it is a medium of proof so very fallacious, that, where it elucidates one fact, it obscures a thousand, and more frequently borders on the ridiculous, than leads to any solid conclusion. It rarely carries with it any *internal* power of conviction from a resemblance of sounds or similarity of letters; yet often, where it is wholly unaffected by those advantages, it may be indisputably proved by *extrinsick* evidence. We know *à posteriori*, that both *fitz* and *hijo*, by the nature of two several dialects, are derived from *filius*; that *uncle* comes from *avus*, and *stranger* from *extra*; that *jour* is deducible, through the *Italian*, from *dies*; and *rossignol* from *luscinia*, or the singer in groves; that *sciuro*, *écureuil*, and *squirrel* are compounded of two *Greek* words descriptive of the animal; which etymologies, though they could not have been demonstrated *à priori*, might serve to confirm, if any such confirmation were necessary, the proofs of a connection between the members of one great empire; but, when we derive our *hanger*, or short pendent sword, from the *Persian*, because ignorant travellers thus mis-spell the word *khanjar*, which, in truth, means a different weapon; or *sandal-wood* from the *Greek*, because we suppose that *sandals* were sometimes made of it, we gain no ground in proving the affinity of nations, and only weaken arguments which might otherwise be firmly supported. That *Cu's*, then, or, as it certainly is written in one ancient dialect, *Cu'r*, and in others, probably

bably, CA's, enters into the composition of many proper names, we may very reasonably believe; and that *Algeziras* takes its name from the *Arabick* word for an *island*, cannot be doubted; but, when we are told from *Europe*, that places and provinces in *India* were clearly denominated from those words, we cannot but observe, in the first instance, that the town, in which we now are assembled, is properly written and pronounced *Calicâtâ*; that both *Câtâ* and *Cût* unquestionably mean *places of strength*, or, in general, any *inclosures*; and that *Gujarât* is at least as remote from *Jezirah* in sound, as it is in situation.

Another exception (and a third could hardly be discovered by any candid criticism) to the *Analysis of Ancient Mythology*, is, that the *method* of reasoning, and arrangement of topicks, adopted in that learned work, are not quite agreeable to the title, but almost wholly *synthetical*; and, though *synthesis* may be the better mode in pure *science*, where the principles are undeniable, yet it seems less calculated to give complete satisfaction in *historical* disquisitions, where every postulatium will, perhaps, be refused, and every definition controverted. This may seem a slight objection; but the subject is in itself so interesting, and the full conviction of all reasonable men so desirable, that it may not be lost labour to discuss the same or a similar theory in a method purely analytical, and, after beginning with facts of general notoriety, or undisputed evidence, to investigate such truths as are at first unknown, or very imperfectly discerned.

The *five* principal nations who have in different ages divided among themselves, as a kind of inheritance, the vast continent of *Asia*, with the many islands depending on it, are the *Indians*, the *Chinese*, the *Tartars*, the *Arabs* and the *Persians*: *who* they severally were, *whence* and *when*

they came, *where* they now are settled, and *what advantage* a more perfect knowledge of them all may bring to our *European* world, will be shown, I trust, in *five* distinct essays; the last of which will demonstrate the connexion or diversity between them, and solve the great problem, whether they had *any* common origin, and whether that origin was *the same* which we generally ascribe to them.

I begin with *India*; not because I find reason to believe it the true centre of population or of knowledge, but because it is the country which we now inhabit, and from which we may best survey the regions around us; as, in popular language, we speak of the *rising* sun, and of his *progress through the Zodiac*, although it had long ago been imagined, and is now demonstrated, that he is himself the centre of our planetary system. Let me here premise, that, in all these inquiries concerning the history of *India*, I shall confine my researches downwards to the *Mohammedan* conquests at the beginning of the *eleventh* century, but extend them upwards, as high as possible, to the earliest authentick records of the human species.

*India* then, on its most enlarged scale, in which the ancients appear to have understood it, comprises an area of near *forty* degrees on each side, including a space almost as large as all *Europe*; being divided on the west from *Persia* by the *Arachosian* mountains, limited on the east by the *Chinese* part of the farther peninsula, confined on the north by the wilds of *Tartary*, and extending to the south as far as the isles of *Java*. This trapezium, therefore, comprehends the stupendous hills of *Potyid* or *Tibet*, the beautiful valley of *Cashmir*, and all the domains of the old *Indoscythians*, the countries of *Népál* and *Butánt*, *Cámrúp* or *Asám*, together with *Siam*, *Ava*, *Racan*, and the bordering kingdoms, as far as the *China* of the *Hindus*,

or

or *Sea* of the *Arabian* Geographers; not to mention the whole western peninsula, with the celebrated island of *Sinhala*, or *Lion-like men*, at its southern extremity. By *India*, in short, I mean that whole extent of country in which the primitive religion and languages of the *Hindus* prevail at this day with more or less of their ancient purity, and in which the *Nāgarī* letters are still used with more or less deviation from their original form.

The *Hindus* themselves believe their own country, to which they give the vain epithets of *Medhyama*, or *Central*, and *Punyabhūmi*, or the *land of Virtues*, to have been the portion of BHARAT, one of *nine* brothers, whose father had the dominion of the whole earth; and they represent the mountains of *Himālaya* as lying to the north; and to the west, those of *Vindhya*, called also *Vindian* by the *Greeks*; beyond which the *Sindhu* runs in several branches to the sea, and meets it nearly opposite to the point of *Dwārakā*, the celebrated feat of their Shepherd God. In the *south-east* they place the great river *Saravatyā*; by which they probably mean that of *Ava*, called also *Airāvati* in part of its course, and giving perhaps its ancient name to the gulf of *Sabara*. This domain of *Bharat* they consider as the middle of the *Jambudwīpa*, which the *Tibetians* also call the land of *Zambu*; and the appellation is extremely remarkable; for *Jambu* is the *Sanskrit* name of a delicate fruit, called *Jāman* by the *Muselmans*, and by us *rose-apple*; but the largest and richest sort is named *Amrita*, or *Immortal*; and the mythologists of *Tibet* apply the same word to a celestial tree bearing *ambrosial fruit*, and adjoining to *four* vast rocks, from which as many sacred rivers derive their several streams.

The inhabitants of this extensive tract are described by Mr. LORD with great exactness, and with a picturesque elegance peculiar to our ancient



language: "A people, (says he,) presented themselves to mine eyes, clothed in linen garments somewhat low descending, of a gesture and garb, as I may say, maidenly and well nigh effeminate, of a countenance shy and somewhat estranged, yet smiling out a glozed and bashful familiarity." Mr. ORME, the Historian of *India*, who unites an exquisite taste for every fine art with an accurate knowledge of *Asiatick* manners, observes, in his elegant preliminary Dissertation, that this "country has been inhabited from the earliest antiquity by a people who have no resemblance, either in their figure or manners, with any of the nations contiguous to them;" and that, "although conquerors have established themselves at different times in different parts of *India*, yet the original inhabitants have lost very little of their original character." The ancients, in fact, give a description of them, which our early travellers confirmed, and our own personal knowledge of them nearly verifies; as you will perceive from a passage in the Geographical Poem of DIONYSIUS, which the Analyst of Ancient Mythology has translated with great spirit:

"To th' east a lovely country wide extends,  
 "INDIA, whose borders the wide ocean bounds;  
 "On this the sun, new rising from the main,  
 "Smiles pleas'd, and sheds his early orient beam.  
 "Th' inhabitants are swart, and in their locks  
 "Betray the tints of the dark hyacinth.  
 "Various their functions; some the rock explore,  
 "And from the mine extract the latent gold;  
 "Some labour at the woof with cunning skill,  
 "And manufacture linen; others shape

"And

" And polish iv'ry with the nicest care :  
 " Many retire to rivers shoal, and plunge  
 " To seek the beryl flaming in its bed,  
 " Or glitt'ring diamond. Oft the jasper's found  
 " Green, but diaphanous; the topaz too  
 " Of ray serene and pleasing; last of all  
 " The lovely amethyst, in which combine  
 " All the mild shades of purple. The rich soil,  
 " Wash'd by a thousand rivers, from all sides  
 " Pours on the natives wealth without control."

Their sources of wealth are still abundant, even after so many revolutions and conquests: in their manufactures of cotton they still surpass all the world; and their features have, most probably, remained unaltered since the time of DIONYSIUS; nor can we reasonably doubt, how degenerate and abased soever the *Hindus* may now appear, that in some early age they were splendid in arts and arms, happy in government, wise in legislation, and eminent in various knowledge: but, since their civil history beyond the middle of the *nineteenth* century from the present time, is involved in a cloud of fables, we seem to possess only *four* general media of satisfying our curiosity concerning it; namely, first, their *Languages* and *Letters*; secondly, their *Philosophy* and *Religion*; thirdly, the actual remains of their old *Sculpture* and *Architecture*; and fourthly, the written memorials of their *Sciences* and *Arts*.

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I. It is much to be lamented that neither the *Greeks*, who attended ALEXANDER into *India*, nor those who were long connected with it under the *Bactrian* Princes, have left us any means of knowing with accuracy,

racy, what vernacular languages they found on their arrival in this Empire. The *Mohammedans*, we know, heard the people of proper *Hindustan* or *India*, on a limited scale, speaking a *Bhāshā*, or living tongue, of a very singular construction, the purest dialect of which was current in the districts round *Agrā*, and chiefly on the poetical ground of *Mat'hurā*; and this is commonly called the idiom of *Vraja*. Five words in six, perhaps, of this language were derived from the *Sanscrit*, in which books of religion and science were composed, and which appears to have been formed by an exquisite grammatical arrangement, as the name itself implies, from some unpolished idiom; but the basis of the *Hindustānī*, particularly the inflexions and regimen of verbs, differed as widely from both those tongues, as *Arabick* differs from *Persian*, or *German* from *Greek*. Now the general effect of conquest is to leave the current language of the conquered people unchanged, or very little altered, in its ground-work, but to blend with it a considerable number of exotick names both for things and for actions; as it has happened in every country, that I can recollect, where the conquerors have not preserved their own tongue unmixed with that of the natives, like the *Turks* in *Greece*, and the *Saxons* in *Britain*; and this analogy might induce us to believe, that the pure *Hindī*, whether of *Tartarian* or *Chaldean* origin, was primeval in *Upper India*, into which the *Sanscrit* was introduced by conquerors from other kingdoms in some very remote age; for we cannot doubt that the language of the *Vēda's* was used in the great extent of country, which has before been delineated, as long as the religion of *Brahmā* has prevailed in it.

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The *Sanscrit* language, whatever be its antiquity, is of a wonderful structure; more perfect than the *Greek*, more copious than the *Latin* and more exquisitely refined than either; yet bearing to both of them a  
stronger

stronger affinity, both in the roots of verbs, and in the forms of grammar, than could possibly have been produced by accident; so strong, indeed, that no philologer could examine them all three, without believing them to have sprung from some common source, which, perhaps, no longer exists. There is a similar reason, though not quite so forcible, for supposing that both the *Gothick* and the *Celtick*, though blended with a very different idiom, had the same origin with the *Sanscrit*; and the old *Persian* might be added to the same family, if this were the place for discussing any question concerning the antiquities of *Persia*.

The characters, in which the languages of *India* were originally written, are called *Nāgarī*, from *Nagara*, a city, with the word *Devā* sometimes prefixed, because they are believed to have been taught by the Divinity himself, who prescribed the artificial order of them in a voice from heaven. These letters, with no greater variation in their form by the change of straight lines to curves, or conversely, than the *Cyphick* alphabet has received in its way to *India*, are still adopted in more than twenty kingdoms and states, from the borders of *Cashgar* and *Khoten*, to *Rāma's* Bridge, and from the *Sindhu* to the river of *Siam*; nor can I help believing, although the polished and elegant *Dēvanāgarī* may not be so ancient as the monumental characters in the caverns of *Jamasandha*, that the square *Chaldaick* letters, in which most *Hebrew* books are copied, were originally the same, or derived from the same prototype, both with the *Indian* and *Arabian* characters. That the *Phœnician*, from which the *Greek* and *Roman* alphabets were formed by various changes and inversions, had a similar origin, there can be little doubt; and the inscriptions at *Canārah*, of which you now possess a most accurate copy, seem to be compounded of *Nāgarī* and *Ethiopic* letters, which bear a  
close

close relation to each other, both in the mode of writing from the left hand, and in the singular manner of connecting the vowels with the consonants. These remarks may favour an opinion entertained by many, that all the symbols of *sound*, which at first, probably, were only rude outlines of the different organs of speech, had a common origin. The symbols of *ideas*, now used in *China* and *Japan*, and formerly, perhaps, in *Egypt* and *Mexico*, are quite of a distinct nature; but it is very remarkable, that the order of *sounds* in the *Chinese* grammars corresponds nearly with that observed in *Tibet*, and hardly differs from that which the *Hindus* consider as the invention of their Gods.

II. Of the *Indian* Religion and Philosophy I shall here say but little, because a full account of each would require a separate volume. It will be sufficient in this dissertation to assume, what might be proved beyond controversy, that we now live among the adorers of those very Deities who were worshipped under different names in old *Greece* and *Italy*; and among the professors of those philosophical tenets, which the *Ionick* and *Attick* writers illustrated with all the beauties of their melodious language. On one hand we see the trident of NEPTUNE, the eagle of JUPITER, the satyrs of BACCHUS, the bow of CUPID, and the chariot of the *Sun*; on another we hear the cymbals of RHEA, the songs of the *Muses*, and the pastoral tales of APOLLO NOMIUS. In more retired scenes, in groves, and in seminaries of learning, we may perceive the *Bráhmans* and the *Sarmanes*, mentioned by CLEMENS, disputing in the forms of *logic*, or discoursing on the vanity of human enjoyments, on the immortality of the soul, her emanation from the eternal mind, her debasement, wanderings, and final union with her source. The *six* philosophical schools, whose principles are explained in the *Dersana Sástra*, comprise all the metaphysics

metaphysics of the old *Academy*, the *Stoa*, the *Lyceum*; nor is it possible to read the *Vedānta*, or the many fine compositions in illustration of it, without believing, that PYTHAGORAS and PLATO derived their sublime theories from the same fountain with the sages of *India*. The *Scythian* and *Hyperborean* doctrines and mythology may also be traced in every part of these eastern regions; nor can we doubt, that WOD or ODEN, whose religion, as the northern historians admit, was introduced into *Scandinavia* by a foreign race, was the same with BUDDH, whose rites were probably imported into *India* nearly at the same time, though received much later by the *Chinese*, who soften his name into FO'.

This may be a proper place to ascertain an important point in the Chronology of the *Hindus*; for the priests of BUDDHA left in *Tibet* and *China* the precise epoch of his appearance, real or imagined, in this Empire; and their information, which had been preserved in writing, was compared by the *Christian* Missionaries and scholars with our own era. COUPLET, DE GUIGNES, GIORGI, and BAILLY, differ a little in their accounts of this epoch, but that of COUPLET seems the most correct: on taking, however, the medium of the four several dates, we may fix the time of BUDDHA, or the *ninth* great incarnation of VISHNU, in the year one thousand and fourteen before the birth of CHRIST, or two thousand seven hundred and ninety-nine years ago. Now the *Cáshmirians*, who boast of his descent in their kingdom, assert that he appeared on earth about two centuries after CRISHNA the *Indian* APOLLO, who took so decided a part in the war of the *Mahábhárat*; and, if an etymologist were to suppose, that the *Athenians* had embellished their poetical history of PANDION's expulsion and the restoration of ÆGEUS with the *Asiatick* tale of the PANDUS and YUDHISHTIR, neither of which words they could have articulated, I should not

hastily deride his conjecture. Certain it is, that *Pándumandel* is called by the *Greeks* the country of *PANDION*. We have, therefore, determined another interesting epoch, by fixing the age of *CRISHNA* near the *three thousandth* year from the present time; and, as the three first *Avatárs*, or descents of *VISHNU*, relate no less clearly to an Universal Deluge, in which eight persons only were saved, than the *fourth* and *fifth* do to the punishment of impiety and the humiliation of the proud, we may for the present assume, that the second, or silver, age of the *Hindus* was subsequent to the dispersion from *Babel*; so that we have only a dark interval of about a *thousand* years, which were employed in the settlement of nations, the foundation of states or empires, and the cultivation of civil society. The great incarnate Gods of this intermediate age are both named *RA'MA*, but with different epithets; one of whom bears a wonderful resemblance to the *Indian* *BACCHUS*, and his wars are the subject of several heroick poems. He is represented as a descendent from *SU'RYA*, or the *SUN*; as the husband of *SI'TA'*, and the son of a princess named *CAU'SILYA'*. It is very remarkable, that the *Peruvians*, whose *Incas* boasted of the same descent, styled their greatest festival *Ramasitua*; whence we may suppose that South *America* was peopled by the same race, who imported into the farthest parts of *Asia* the rites and fabulous history of *RA'MA*. These rites and this history are extremely curious; and although I cannot believe, with *NEWTON*, that ancient mythology was nothing but historical truth in a poetical dress; nor, with *BACON*, that it consisted solely of moral and metaphysical allegories; nor, with *BRYANT*, that all the heathen Divinities are only different attributes and representations of the Sun, or of deceased progenitors; but conceive that the whole system of religious fables rose, like the *Nile*, from several distinct sources; yet I cannot but agree that one great spring and fountain of all idolatry, in the four quarters of the globe, was the veneration paid by

men

men to the vast body of fire which "looks from his sole dominion like the " God of this world;" and another, the immoderate respect shown to the memory of powerful or virtuous ancestors, especially the founders of kingdoms, legislators, and warriors, of whom the *Sun* or the *Moon* were wildly supposed to be the parents.

III. The remains of *Architecture and Sculpture* in *India*, which I mention here as mere monuments of antiquity, not as specimens of ancient art, seem to prove an early connection between this country and *Africa*. The pyramids of *Egypt*, the colossal statues described by PAUSANIAS and others, the Sphinx, and the HERMES *Canis*, (which last bears a great resemblance to the *Varahavatár*, or the incarnation of VISHNU in the form of a *Boar*;) indicate the style and mythology of the same indefatigable workmen who formed the vast excavations of *Canarah*, the various temples and images of BUDDHA, and the idols which are continually dug up at *Gayá*, or in its vicinity. The letters on many of those monuments appear, as I have before intimated, partly of *Indian*, and partly of *Abyssinian* or *Ethiopic*, origin; and all these indubitable facts may induce no ill-grounded opinion, that *Ethiopia* and *Hindustán* were peopled or colonized by the same extraordinary race; in confirmation of which, it may be added, that the mountaineers of *Bengal* and *Bahár* can hardly be distinguished in some of their features, particularly their lips and noses, from the modern *Abyssinians*, whom the *Arabs* call the children of CUSH: and the ancient *Hindus*, according to STRABO, differed in nothing from the *Africans*, but in the straightness and smoothness of their hair, while that of the others was crisp or woolly; a difference proceeding chiefly, if not entirely, from the respective humidity or dryness of their atmospheres. Hence the people who *received the first light of the rising sun*, according to the limited knowledge



of the ancients, are said by APULEIUS to be the *Arü* and *Ethiopians*, by which he clearly meant certain nations of *India*; where we frequently see figures of BUDDHA with *curled hair*, apparently designed for a representation of it in its natural state.

IV. It is unfortunate that the *Silpi Sástra*, or *Collection of Treatises on Arts and Manufactures*, which must have contained a treasure of useful information on *dying, painting, and metallurgy*, has been so long neglected, that few, if any traces of it are to be found; but the labours of the *Indian* loom and needle have been universally celebrated; and *fine linen* is not improbably supposed to have been called *Sindon*, from the name of the river near which it was wrought in the highest perfection. The people of *Colchis* were also famed for this manufacture; and the *Egyptians* yet more, as we learn from several passages in scripture, and particularly from a beautiful chapter in EZEKIEL, containing the most authentick delineation of ancient commerce, of which *Tyre* had been the principal mart. Silk was fabricated immemorially by the *Indians*, though commonly ascribed to the people of *Serica* or *Tancüt*, among whom probably the word *Sér*, which the *Greeks* applied to the *silk-worm*, signified *gold*; a sense which it now bears in *Tibet*. That the *Hindus* were in early ages a *commercial* people, we have many reasons to believe; and in the first of their sacred law-tracts, which they suppose to have been revealed by MENU many millions of years ago, we find a curious passage on the legal *interest* of money, and the limited rate of it in different cases, with an exception in regard to *adventures at sea*; an exception which the sense of mankind approves, and which commerce absolutely requires; though it was not before the reign of CHARLES I. that our own jurisprudence fully admitted it in respect of maritime contracts.

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We are told by the *Grecian* writers, that the *Indians* were the wisest of nations; and in moral wisdom they were certainly eminent. Their *Niti Sástra*, or *System of Ethics*, is yet preserved; and the Fables of VISHNUSERMAN, whom we ridiculously call *Pilpay*, are the most beautiful, if not the most ancient, collection of apologues in the world. They were first translated from the *Sanscrit*, in the sixth century, by the order of BUZERCHUMIIR, or *Bright as the Sun*, the chief physician and afterwards *Vezir* of the great ANU'SHIRVAN, and are extant under various names in more than twenty languages; but their original title is *Hitópadesa*, or *Amicable Instruction*; and, as the very existence of Esop, whom the *Arabs* believe to have been an *Abyssinian*, appears rather doubtful, I am not disinclined to suppose that the first *moral fables* which appeared in *Europe* were of *Indian* or *Ethiopian* origin.

The *Hindus* are said to have boasted of *three* inventions, all of which, indeed, are admirable; the method of instructing by *Apologues*; the *decimal scale*, adopted now by all civilized nations; and the game of *Chess*, on which they have some curious treatises: but, if their numerous works on Grammar, Logick, Rhetorick, Musick, all which are extant and accessible, were explained in some language generally known, it would be found, that they had yet higher pretensions to the praise of a fertile and inventive genius. Their lighter poems are lively and elegant; their epick, magnificent and sublime in the highest degree. Their *Purána's* comprise a series of mythological histories, in blank verse, from the *Creation* to the supposed incarnation of BUDDHA; and their *Védas*, as far as we can judge from that compendium of them, which is called *Upanishat*, abound with noble speculations in metaphysics, and fine discourses on the being and attributes of God. Their most ancient medical book, entitled *Chereca*, is believ-

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ed to be the work of SIVA ; for each of the Divinities in their *Triad* has at least one *sacred* composition ascribed to him. But as to mere human works on *History* and *Geography*, though they are said to be extant in *Cashmir*, it has not been yet in my power to procure them. What their *astronomical* and *mathematical* writings contain, will not, I trust, remain long a secret : they are easily procured, and their importance cannot be doubted. The philosopher whose works are said to include a *System* of the Universe, founded on the principle of *Attraction* and the *central* Position of the Sun, is named YAVAN ACHA'RYA, because he had travelled, we are told, into *Ionian*. If this be true, he might have been one of those who conversed with PYTHAGORAS. This at least is undeniable, that a book on astronomy in *Sanscrit* bears the title of *Yavana Jatica*, which may signify the *Ionick Sect*. Nor is it improbable, that the names of the Planets and *Zodiacal Stars*, which the *Arabs* borrowed from the *Greeks*, but which we find in the oldest *Indian* records, were originally devised by the same ingenious and enterprising race, from whom both *Greece* and *India* were peopled ; the race, who, as DIONYSIUS describes them,

——— ' first assayed the deep,

• And wasted merchandize to coasts unknown,

• Those who digested first the starry choir,

• Their motions mark'd, and called them by their names.'

Of these cursory observations on the *Hindus*, which it would require volumes to expand and illustrate, this is the result : that they had an immemorial affinity with the old *Persians*, *Ethiopians*, and *Egyptians* ; the *Phenicians*, *Greeks*, and *Tuscans* ; the *Scythians* or *Goths*, and *Celts* ; the *Chinese*, *Japanese*, and *Peruvians* ; whence, as no reason appears for believing that

they

they were a colony from any one of those nations, or any of those nations from them, we may fairly conclude that they all proceeded from some *central* country, to investigate which will be the object of my future discourses; and I have a sanguine hope that your collections, during the present year, will bring to light many useful discoveries; although the departure for *Europe* of a very ingenious member, who first opened the inestimable mine of *Sanscrit* literature, will often deprive us of accurate and solid information concerning the languages and antiquities of *India*.



## XXVI.

CORRECTIONS OF THE  
LUNAR METHOD OF FINDING THE LONGITUDE.

BY MR. REUBEN BURROW.

**T**HE intent of the following remarks is to point out an error in the usual practice of making the Lunar Observations, and another in the Method of Computation.

It is well known that a little before and after the conjunction, the whole hemisphere of the moon is visible, and the enlightened crescent seems to extend some distance beyond the dusky part. Now, having determined the longitude of a place from the eclipses of Jupiter's satellites, I took several sets of distances of the moon's limb from a star near the time of the conjunction, both from the bright and the dusky parts of the circumference, and having calculated the results, I found that those taken from the dusky part were much nearer the truth than the others. The nature of the error evidently shewed, that the star had really been at some distance from the limb when it appeared to be in contact with it; and, as the error was a considerable part of a degree, I saw it would be of consequence to discover the cause of it; which, however, was obvious enough from NEWTON's principles, and may be explained as follows.

Let AD be the diameter of the moon, and A the centre of a star in contact with the moon's limb: now, as the enlightened part of the moon evidently appears to extend beyond the dusky part, let the concentric

circle BC represent the moon's limb thus apparently magnified, and suppose the flat to be equally magnified; then with the centre A, and the distance DC describe a circle, which consequently will touch the moon's apparent circumference inwardly; now, as this last is a consequence of supposing the centre of the star to touch the circumference of the moon, exclusive of the deception, it follows, that *the proper method of taking the distance, is to make the star appear to touch the moon inwardly.*

But all the writers on this subject have particularly directed that the star be made to touch *outwardly*: let B, therefore, be the point of contact, and *a* the centre: the error then is Aa, or the sum of the apparent increase of the moon's radius and the apparent radius of the star: this quantity, it is evident, will make a considerable error in the result; and errors arising from this source are the more to be attended to, as they are not of a kind to be lessened by increasing the number of observations. The same reasoning is applicable to the sun and moon with very little alteration.

The distance of the moon from the sun or a star, at each three hours, is given in the Nautical Ephemeris, and the method of inferring the time for any intermediate distance, is by simple proportion: this would be just if the moon's motion was uniform: but as that is not the case, the velocity should be taken into the account, as well as the space, in determining the time, taken by the moon to move any given distance; and the proper measure of the velocity is such a quantity, as has the same ratio to the space described, as three hours have to the time that has been actually taken to move the given distance: to find this quantity correctly, would require interpolation, but it will be sufficient in practice to find the time  
first

first by the common method, and then to correct the interval for three hours to that time, by taking a proportional part of the second difference of the moon's distance at the beginning of each three hours; supposing the first differences to answer to the middle of each interval.

The last correction, though not so considerable as the first, will often bring the result nearer to the truth by three, four, five, or six miles, and sometimes more, which in geographical determinations is of consequence; and, by paying attention to those and some other causes of error, which shall be pointed out hereafter, the results in general will be much nearer to the truth than is usually imagined. It is common to throw blame on the imperfections of the Lunar Tables, but it would be much more properly applied to bad instruments and bad observers.

THE END OF THE FIRST VOLUME.





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*From 15 January 1784 to 15 January 1789.*

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**A P P E N D I X**  
TO THE  
**FIRST VOLUME**  
OF  
*ASIATICK RESEARCHES.*

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A  
**METEOROLOGICAL JOURNAL,**  
*Kept by Colonel T. D. PEARSE, from 1st March, 1785, to 28th  
February, 1786.*

Day	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
	h. m.	D L. Q.									
3	22 49										
6	7.15 A	29.963		77		thin	3	SSW	1		(a)
7	3. P	29.915		79		thin	5	SSW	3		(b)
	6.30 P					thick thund.	10	SSW	3		(c)
8	7.30 A	30.00		76		ditto	9	SSW	2		(d)
	7. P					thick	10				
	8. P							NW			
9	7. A	30.032		75.5		thick thund.	8	NW	1		(e)
	1.55 P	29.97		79.5		none					
	16.27	D New									
10	4.50 P					thick thund.	9	NW	6		
	5.39 P					ditto	8	S	3		
	6.15 P	29.95		76.5		ditto	8	S	4	1.42	(f)
11	7. A	30.00		70				S by W	1		
12	6.35 A	29.95		79				S	1		(g)
13	6. A	29.85		79				S by E	1		(h)
	2. P					thick	4	S	3		
	4. P					thick thund.	8	S by E	3		
	5.2 P	29.77		80.5		ditto	9	S	5	1.259	
	5.30 P										
14	7. A					thick	6	SSE	2		
	2.20 P	29.816		83		ditto	9	SSE	2		
15	6.45 A	29.854		79.5				S by E	1		(i)
	8.25 P					thick thund.	9	N	5		
16	7.40 A	29.873		78		ditto	10			1.022	(l)
	2.20 P	29.813		82		thick loose	8	SSW	4		
	12.52	D F. Q.									
17	7.15 A	29.887		80		thick	5	SE	1	1.039	(l)
	2.30 P	29.828		84		ditto	4	SSE	2		
Carried forward.										-	1.462

(a) Last Friday the fog was excessive, and did not begin to clear till 9. Saturday the same. Sunday it began to clear about 7.

(b) The fog is gone off to-day already: it was but slight.

(c) Much lightning in the NW. and distant thunder.

(d) Much lightning in the NW. A puff from the NW. but without rain or thunder.

(e) There was a very small sprinkling of rain just now.

(f) In the morning we had a thick fog, which formed into clouds, and went over to the N. and at 2 maffes were formed there: from whence at 4.50 we had a storm, which was over in half an hour; and at Dundrum, about 10 miles off, they had heavy hail.

(g) Fog so thick that an object at a 100 yards is invisible.

(h) 6 A. Foggy. A storm will come on in the evening. 4 P. Distant thunder. 5.2 P. We have had a furious storm of hail, with thunder and lightning, and SW to SSE 6. 5.30 P. Loud thunder still continues in the ENE. where the maffs now is.

(i) 6.45 A. Every thing hidden in fog, which will produce a storm at night 8.25 P. Much lightning, and the expected storm coming on.

(k) 7.40 A. The thunder rolled all night: excessive lightning.

(l) 7.15 A. A storm began to gather about 5 P. and we had much lightning about 10. Between 12 and 1 it began, and the wind very violent. The thunder clofe, and so heavy, that it jarred the whole house like an earthquake. 2.30 P. It has been very gloomy at times all day.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Miscellaneous.
				In.	Out.	Kinds.	Quant.	Quarter.	Force.		
18	6. A	29,915		80		thin		Brought forward,		,462	
	2. P	29,85		86		loofe	3	S	1		
19	2.20 P	29,813		84			3	S	4		
20	1.30 P	29,833		85		thin	9	W by S	2		
21	6.15 A	29,813		81		thin	2	SSW	3		
	2. P	29,80		86		thick & thin	5	SW by S	2		
22	6.30 A	29,825		82		thick loofe	10	S by W	4		(m)
	2. P	29,837		86		thick	3	SW by S	3		
23	2. P	29,784		85.5		thin	7	SW by S	5		(n)
	7.45					thick thund.	10	SSW	5	,084	
24	8. A	29,87		81.5		thick	7				(o)
	2. P	29,825		85		thick thund.	10	W by S	2		
	9. P									,001	
	h. m.										
	16.02	D Full									
25	6.15 A	29,859		82		thick	4	SSE	2		
	2. P	29,866		86		none		S	3		
26	5.45 A	29,915		82		thick loofe	10	S	1		(p)
	2.15 P	29,87		86.2				S	4		
27	7.15 A	29,865		82		thick	10				
	2.15 P	29,785		87				S	2		
28	6.45 A	29,795		81				S	1		(q)
	2.10 P	29,796		87.5				SSW	4		
29	6.45 A	29,862		81.5		thin	2	S by W	1		(r)
	2.15 P	29,830		87.0				SSW by W	3		
30	6.45 A	29,822		81.5		thin	5	S by E	1		(s)
	1.30 P	29,818		83.5		thick	10	NE	1		
31	7.15 A	29,862		79.0		ditto	10	NNE	1	,007	(t)
	2. P	29,797		83.0		ditto	9	NNW	1		
TOTAL IN MARCH, -										,554	

(m) Great appearance of approaching rain and storm.

(n) 8. A. The morning was very cloudy, and the wind strong; it prefaged a storm; and I still expect one before midnight. At sun-set it threatened, and at 7 P. the lightning began to be vivid in the WNW. It rained for about ten minutes. The thunder was very near.

(o) 8. A. The wind began about 11. P. and raged till past 1 o'clock with uncommon violence. 2. P. Exceedingly gloomy. 9. P. At 7 we had a thunder gust, which was soon over, with a sprinkling only.

(p) 5.45 A. The clouds began to collect at 8 last night and are very thick. 2.15 P. The clouds continued very thick till past 10, and were not dispelled till past 1.

(q) 6.45 A. Exceedingly thick fog. 2.10 P. The true along-shore wind, which disorders the whole frame.

(r) 6.45 A. Foggy. Last night the clouds were thick 10 at 11 P.

(s) 6.45 A. Foggy. It has been extremely gloomy ever since 7 o'clock, and about noon we had a few drops of rain.

(t) 7.15 A. We had a small shower of rain about sun-rise, and there has been more at a distance from the feel of air.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	April 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	6.45 A	29.866		79.5		thick thund.	10	WNW	2		
	2.10 P	29.816		82		thick	10	SE	1		(a)
2	10-16	D L. Q.									
	6.45 A	29.828		77				E S	1		
3	2. P	29.777		83.7		thick scat.	3	WNW	3		
	6.45 A	29.765		79				S by W	1		
4	2. P	29.711		85.5		none		WNW	2		
	7. A	29.785		80				SE by S	1		
5	2. P	29.750		86				WNW	1		
	6. A	29.763		78		thick	2	SE	2		(h)
6	1.45 P	29.760		86.7		thick gadier.	3	S by E	2		
	6.30 A	29.76		80.5		thick	5	E	3		(i)
7	2. P	29.748		88		ditto	1	SW S	4		
	7. A	29.82		80							
8	2. P	29.79		87.5				SSW	5		(d)
	7. A	29.846		81.5		loofe	4	S by E	2		(e)
9	2. P	29.761		87.5	94			SW S	4		
	1.39	D New									
10	6.30			81		thick loofe	10	S	2		
	2. P	29.75		88.5	96.5			S by W	4		
11	7.45 A	29.76		84		thick	9	SSW	5		
	2. P	29.718		88	92.2			SSW	5		(f)
12	5.30 P	29.708		87	88	thick	10	SSW	5		
	6.40 A	29.788		85	81.5	thin	7	SSW	2		(g)
13	2. P	29.766		89.5	96.0	ditto	8	SW by S	5		
	6.15 P	29.779		88	93.15	thick thund.	8	SSW	3		(b)
14	8. P									.016	
	7.15 A	29.740		83				NE	2		
15	2.30 P	29.765		90.5	100.5			SW by S	2		
	6.30 A	29.783		82	81	thick & thin	10	N	2		(c)
16	10. P	29.818		84	83.5	thick	10		1	.002	
	7. A	29.820		83	85	ditto	9	S by W	3		
17	2.30 P	29.848		86	88	ditto	10	S	2		(d)
	7. A	29.915	28	82	81	ditto	10	S W	1		
18	1.45 P	29.90	22.5	85	92	ditto	10	NE	1		(f)
Carried forward,										.018	

(a) We had a sprinkling rain to-day of half an hour's duration.

(h) Excessively thick haze.

(i) Last night the clouds were so heavy that they seemed to threaten a storm.

(d) There were flying clouds from 8 till 11 to-day, but all are gone.

(e) Yesterday evening there was a mass over Calcutta, and much lightning and some thunder, and this morning we had a fog.

(f) There will be a storm to day. 5.30 P. Distant thunder. The bank is not yet formed.

(g) The wind was tempestuous the greatest part of the night, but we had not any rain. It is now foggy, and threatens.

(b) Yesterday there was every reason to expect a violent storm, but it went off from us. To-day there was but little expectation, and it now rains smartly, and there has been a great deal of thunder; and all this without any change of wind.

(c) We had a small shower at 1, and another just now. The wind was NE 2 all the afternoon.

(d) The wind changed suddenly just after last observation to the S again, and we had a very windy night. 2.30 P. It has been gloomy all day.

(f) A sprinkling rain in very distant drops. The wind of the night was of such a kind, that it prevented the possibility of sleeping.

The morning rain, and a like sprinkling since, could not be measured.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Wind direction.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
16	7. A	29.95	15	80	82.5	thick	10	Brought forward,		.018	(m)
	8.15 A	29.99	17.5	80	74	ditto	10	N	4		
	2.15 P	29.893	29	80	80	ditto	10	NE by E	3	.087	
	3.44 P	D F. Q.				ditto	10	NE	4		
17	7.15 A	29.864	32	70.5	86	thick	10	E by N	4	1.314	(r)
	2.15 P	29.79	43	78	75	ditto	10	S by E	3	.763	
	8.20 P	29.828	44	78	74	thick loofe	10	SE by E	3	.752	
18	6.15 A	29.80	46	79.5	76	thick	9	SSW by S	1	.284	(o)
	2.15 P	29.839	48.3	80.5	86	thick white fc.	4	NW	1		
	7. A	29.913	50	80		thick loofe	7				
19	2.15 P	29.813	43.5	83.5	90	thick white	7	SW by S	2		(f)
	5.40 A	29.8	43.5	79.5	76	thin	4	S by W	2		
	2.25 P	29.792	42	86	90	thick loofe	4	S	4		
20	10. P	29.881	36.5	76.5	80.9	thick	10	NNE	3		(r)
	6. A	29.812	40	76.9	73.5	ditto	3	SSE	3		
	2. P	29.876	41	77	74	ditto	10	SW by S	3	.410	
21	8. A	29.876	41	77	74	ditto	10	SW by S	3	.410	(r)
	2. P	29.785	36.5	82	89	scattered	2	SSW	3	.007	
	5. A	29.750	50	70	77			SW	2		
22	2.15 P	29.760	46	80	93			S by W	2		(r)
	7. A	29.748	54	82.5	84			S	2		
	2. P	29.722	45	87.5	94	scattered	2	S by W	3		
23	8.3 P	y Full									(r)
	6.30 A	29.71	53.5	83	83			SSE	2		
	2. P	29.71	42	90.5	96.5	scattered	3	S by E	4		
24	7.15 A	29.740	47	84	85	ditto	3	S	2		(r)
	2. P	29.735	39	89	94	thick	9	S by E	4		
	7. A	29.705	47.5	84						.220	
25	2. P	29.697	43	87.5	91	thick	9	S by E	4		(w)
	7. P	29.711	43	83	86	thick thund.	10	NNE to	7		
	8. P							NNW			
26	9.45 P							WNW	9	.170	(w)
	6.45 A	29.713	40	81.5	78	none		SW by S	2	.270	
	2. P	29.723	44	87.5	93			SW by S	2	.013	
27	6. A	29.713	49	83.5	80.5	none		SW by S	2		(w)
	2. P	29.753	37	87.5	93			W by S	2		
	7. A	29.79	50	83.5	84	none		SW by S	2		
28	2. P	29.79	37.5	91	97.5	thick small scat.	2	SSW	1		(w)
TOTAL IN APRIL.										.4308	

(m) It has been a blowing cold night; wind northerly, and it sprinkles rain. 8.15 A. A heavy shower just over, and drizzling rain still continues. 2.15 P. We have had more sprinkling rain.

(o) About 6 yesterday it began to rain in drops; before 9 it was smart rain. It has continued all night, and still rains. 2.15 P. It has rained incessantly all day. It still rains hard, and now the clouds begin to break a little. 8.20 P. It still sprinkles.

(p) It began to thunder at a great distance about 8, and by 12 it was near us; and this put an end to the rain before 3. A.

(f) The morning was foggy.

(g) A small shower of rain, and the wind changed from the S. to NNE.

(r) At 12 P. a mass formed in the NW. came on; and in a short time we had a storm without thunder. It sprinkles to-day. 2. P. Produce of the sprinkling.

(s) Very hazy and foul air.

(t) Lightning last night; and very foul air to-day.

(w) A regular northwester last night at 8. P. 7. P. Sprinkling rain begun. 8. P. the produce of the storm, which is abated; distant thunder. 9.45 P. A very severe storm just over, which begun about 8.20. It still thunders.

(x) This was, with produce of a small shower, about 10.30 P.

(y) The night very hot, and the air loaded with damp; the morning cool and pleasant.

Day.	Time.	Barometer.	Thermometer.	Thermometer.		Clouds.		Wind.		Rain.	May 1755.	Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.			
1	7.40 A	29.813	47.5	84	86			SW	3			
	2.10 P	29.762	32.5	90	98.5			W	3			
	6.22 A	D L. Q.										
2	7.45 A	29.750	47.5	84	86	scattered	3	SW	4			
	2. P	29.710	38	89	98	ditto	1	SSW	3			
3	6. A	29.712	45	83.9	82			SSW	2			
	2. P	29.720	38	89	95	none		SSW	4			
4	6. A	29.735	39	83.3	82			S by W	2			
	2.20 P	29.780	36	88.5	93			SSW	4			
5	5.30 A	29.745	43	83.5	81.5	loose	9	S by W	2			
	2. P	29.746	37	89	94	ditto	3	S by W	5			
6	5.30 A	29.808	37	82	79.5			S by W	2			
	2. P	29.800	32	88	94.5	thin	2	S by W	5			
	8.45 P	29.997	28.5	82.5	78.5	thick thund.	10	NW by W	7			
7	9 P	30.000	32.5	82	72	ditto	10	NW by W	3	.328		
8	5.30 A	29.840	31.5	81.5	76.5	thin	8	NNW	1			
	6. A	29.897	40	81	81	thick	5	S by W	1			
	2.30 A	29.90	32.5	88	94	thick	3	SSW	4			
	10.25 P	D New										
9	5.30 A	29.875	44	81.5	80	thin	7	S	1			
	2. P	29.882	34	88	95.5	thick	6	SW by S	4			
10	7. A	29.867	41	82.7	84.6	thin	3	SW by S	3			
	2. P	29.843	32.5	88	95.5	thick	5	S by W	4			
11	7. A	29.810	40	83.3		thick & thin	10					
	2. P	29.783	31.5	89	97.5	thick feat.	2	SSW	4			
	7.30 P	29.744	35.5	87.5	86.7	thunder	4	SSW	3			
	7.47 P	29.814		87		ditto	9	NW	5			
	7.55 P	29.808	31	87	82	thunder	9	NW	7			
	8.25 P	29.808	35	83	73	ditto	10	NW by W	2	.325		
	9. P	29.754	36	79.5	74	ditto	10	ENE	2			
12	5.40 A	29.718	41	82.5	81	thick	10	S by W	2			
	2.20 P	29.752	32	89	96			SSW	4			
13	7.30 A	29.753	42	85	85	thin	7	S	4			
	2.20 P	29.754	35.5	91.5	95.5	loose	8	S by E	3			
14	5. A	29.785	35	82	78	thick	3	N by W	1			
15	5. A	29.797	39	81.9	81.3	thin		E by S	2			
	2. P	29.765	26	90.5	96			NE	3			
	7.10 P	29.752	24	88.7	88.3	thick thund.	9	W by S	3			
16	6.15 A	29.777	34	83	82.2	thin	2	NE	1			
	8.54 A	D F. Q.										
	2. P	29.740	17.5	89	95.5	thick thund.	4	WNW	2			
Carried forward.										.653		

(a) Much lightning last night, and a mass in N and NW. from whence we had a blast of wind at 10. P. 8.45 P. Sprinkling rain begun. 9. P. Very heavy thunder; a smart shower just over.

(b) A heavy thunder mass in NW. and much lightning, with distant thunder. 7.47 P. The wind was changed, and the mass reached the zenith. 7.55 P. Small rain begun. 8.25 P. Heavy rain over, small rain continues.

(c) A very oppressive heat to-day. The air does not carry off perspiration, and makes the whole body chimney and comfortable.

(d) The heat produced thunder all the afternoon till near 10, with squalls of wind from every quarter in turn, but without rain.

(e) The wind shifted about a quarter of an hour ago.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Remarks.
				In.	Out.	Kind.	Quant.	Quarter.	Dir.		
17	6.15 A	29.810	32.5	80.5	80.7	thick	7	Brought forward.		0.635	
	2.15 P	29.785	25	89.5	98.5			E NE	2		
18	7.30 A	29.865	37.5	82	84.5	low	3	SW by W	4		(f)
	10.30 A	29.895	30	85.8	87.5	thunder	10	E by S	3	0.57	(g)
	11.5 A	29.886	36	81.7	78	ditto	10	E NE	3	0.58	
	2.20 P	29.813	38	85	90	thick & thin	4	SE	3		
19	7.10 A	29.850	37.0	80	77.5	ditto	5	NW by W	3	0.03	(h)
	2.15 P	29.763	30	85.7	94.5	feat. hard	2	WSW	3		
22	7.5 A	29.713	36	83.5	85.3			NE	2		(i)
	2.10 P	29.677	28	90	95.5	thick	7	E	3		
23	7.30 A	29.655	38	84	87	thin	3	NE by E	2		(j)
	2.10 P	29.613	27.5	89.3	95	thick	6	NW	3		
24	7.55 A	29.561	37	88	92			S by S	4		
	9.22 A	29.515	22	92.3	101.0	scattered	4	WNW	3		
	6.40 P	29.502	21	91.5	91.5	thunder	8	N	3		(k)
	6.55 P		21			ditto	8	SSE	5	0.24	
25	7.40 A	29.563	21	81.7	83.7	thin & thick	10	S by W	3	0.33	(m)
	2. P	29.573	37	90	96	ditto	10	SW	4		
	8.50 A	29.592	33	80.5	74.8	thunder remains	10	S by E	3	0.56	
26	7.50 A	29.640	35.5	81	82	thin uniform	10	E by S	3	0.26	(n)
	2.40 P	29.616	35	86.5	93	thin	10	SW	3		
27	7. A	29.650	35	84	84	thin	10	S. W	3		
28	7.30 P									0.36	(o)
	11. P	29.765	40	82	76	thunder	10	W by N	4		
29	8.30 A	29.742	38	84	86.5	scattered	2	SSW	3	0.82	
	2.23 P	29.696	39	88.3	92.5	thick	7	SW	5		
	8.10 P	29.703	43.5	86	86	thunder	10	S	5		
	8.25 P	29.757	43.5	86	86	ditto	10	N by E	1		
30	6.40 A	29.710	47	84	85.5	thin & thick	5	W by W	2	0.73	
	10.30 P	29.663	44	86.5	85.5	thunder	10	SSW	3		(p)
31	7.40 A	29.641	46	86.3	80	ditto	10	ESE	2	0.27	(q)
	11.57 A	29.610									
	2.20 P	29.590	44	87	93	thick	7	SW	3		
TOTAL IN MAY.										3.690	

(f) The clouds were 6 about 10, but are all gone.

(g) A final thunder shower at 7 P. visited the water. It came from ENF. 10.30 A. A thunder flower just over of about ten minute duration. 11.5 A. A very heavy thunder storm at over; it began immediately after last observation.

(h) We had another storm in the night, with a sprinkling of rain.

(i) We had a mass of thunder clouds from NNW last night, without rain. 2.10 P. The heat very oppressive.

(k) We were almost suffocated last night. I could not close my eyes and rest.

(l) It rains, and there has been distant thunder. 6.55 P. Thunder close and loud, heavy rain.

(m) Between 11 and 12 the storm came on, in heavier than before. 2 P. The rain was very off perspiration, and therefore leaves the body clammy. 8.50 P. 7 we had a most tremendous rain N 8: a torrent of rain, but of short duration; and all has been quiet since then.

(n) After last observation, it began to rain small rain, which continued some time.

(o) We had in town a very violent northwester, and it reached the gardens, where it produced this rain. 11.15 P. The day has been hot and the sky covered with thin clouds, but they have collected, and we had much lightning in the WNW, and now the storm has reached us.

(p) Much lightning in the NNE, and distant thunder.

(q) It sprinkled rain soon after last observation, but at 5 A. we had a tremendous thunder-storm.

Day	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	April 1785	Miscellaneous
				In.	Out.	Kind.	Quant.	Quarter.	Force.			
1	7.10 A	29.570	47	84	86.5	thunder	5	SSW	3			(a)
	2.30 P	29.525	37	89	103.0			SSW	3			
	8.40 P	29.612	41	88.5	88	thunder	10	WNW	5			
	9.15 P	29.637	38	85.2	77	ditto	10	SW by W	4			
2	7. A	29.585	45	84	85	thick	8	S by E	3	.665		(b)
	2.20 P	29.590	42	84	88	ditto	10	S by E	3			
3	6.40 A	29.565	46	82	83	thin	3	SE	3			
4												
5										.168		(c)
6	8. A	29.592	48	84	87	thick	6	ESE	2	.154		(d)
	7.38 A	29.616	51	83	84.5	thunder	10	SSE	3	.100		(f)
7	8.20 A	29.621	52	83		thick	10	SE by S	4			
8	2.20 P	29.580	48	83.5	88	ditto	10	S by E	3	.503		(g)
9	8.40 A	29.657	47.5	80	77	thick loose thun.	10	SSW	3	.700		(h)
	1.50 P	29.625	50	81	79.5	ditto	10	SSE	4	.469		
10	8.15 A	29.655	55	85	87	thick loose, loose	5	S by W	4			
	2.15 P	29.617	52.5	83.5	86	ditto	10	S by W	4	.036		(i)
11	7.30 A	29.655	57.5	81	88.5	scattered	4	S by E	3	.056		(j)
	2.20 P	29.633	48.5	88	95	ditto	6	S by E	4			
12	7.30 A	29.653	51.0	84	87.5	loose	7	S by E	4			
	2.23 P	29.580	45.0	86	90	ditto	5	S	4			
13	5.35 A	29.593	54	83	82	thin	5	S	2			
14	5.25 A	29.500	50	83	81.5	ditto	5	S	2	.478		(l)
	2.28 A	29.420	51	83.5	82.5	thick & thin	9	NW	3	.006		(m)
15	2.20 P	29.367	53	82.5	80.5	thick	10	NW	4	1.317		(n)
16	7.40 A	29.472	52.5	80.5	78	thick loose	10	WSW	3	1.700		
	2.15 P	29.450	53	83	87	thick	10	SW by S	3	.188		
17	6.15 A	29.504	55	80	78	ditto	10	SW by S	3	.477		(o)
18	6.35 A									1.736		(p)
	8.15 A	29.630	55	79	75.8	thick loose	10	S by E	3	.200		
	2.15 P	29.581	55	82.5	85	thick	10	S by E	3	.150		

Carried forward, -10.104

(a) There was a great deal of thunder last night. About 2 it was most oppressively sultry, being a dead calm. 8.40 P. After excessive lightning in the NW. the mists have reached us, and the storm is begun. 9.15 P. It still rains smartly: the thunder now approaches, but is very far off. This looks more like the rain than any thing we have yet had; and if the wind veer to the south we may reasonably expect them.

(b) Produce of last night's storm. (c) Produce of a thunder-storm at noon. (d) Do. and at noon also.

(e) There was a storm at noon, and at dinner time, and the evening was fine.

(f) It has rained this morning with thunder; this water is yesterday's and to-day's.

(g) We had rain yesterday, and twice to-day, and this is the produce of all.

(h) It began to blow and thunder and lighten at 12.30, and before 1. A. we had a heavy shower. Ever since it has rained more or less, with much thunder. 1.50 P. It has rained without ceasing, more or less, ever since morning.

(i) We have had a thunder shower from SW.

(j) There was a shower at day-break.

(k) At 6 P. yesterday a heavy shower from NW gave this water: and there was only a sprinkling in town. (m) There was a small shower about 3, and another about 9 P. 2.20 P. Heavy showers began about 9, and still continue with short intervals.

(n) It has rained ever since last observation; at times only sprinkling, at others smartly; and now moderately. 2.15 P. The rain abated gradually, and ceased before noon.

(o) At 9 P. a thunder storm from the W. brought on rain again, and it continued till morning.

(p) It was running out through the air-hole. How long it had done so I cannot tell; but it rained all day yesterday: drizzling and at times barely perceptible; heavily about 6 P. and drizzling till near dusk; then hard again; and now it rains smartly, as it did when the water was measured, and there is none in the measure besides. 2.15 P. The rain ceased about 10, and the sun shone at noon.

Day.	Time.	Baromet.	Hygromet.	Thermometer.		Clouds.		Wind.		Rain.	June 1785.	Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.			
19	8. A	29,558	58	81,5	84,3	scattered	6	Brought forward,		10,104		
	2.20 P	29,528	52	83	82,8	thick	10	SSW	2	,375		(g)
20	8. A	29,567	50	81,5	84,5	thin & thick	7	WN	2	,156		
	2.10 P	29,520	50	81,3	84,5	ditto	6	SSW	3	,004		(i)
21	7.35 A	29,549	53	80	78,5	loose low thick	10	SE	4	,332		
	2.15 P	29,522	48	83	89,7	scattered	5	SW by S	2	,132		(i)
22	7.25 A	29,552	53	81,5	81,5	thick	10	W	4	,001		
	8.11 A	Full							2	,007		(i)
	2.25 P	29,525	51,5	83	90,5	thick scat.	7	S by W	2			
23	8.50 A	29,539	55	82	79,5	loose	10	NW	1	3,250		(v)
	2.20 P	29,521	56,5	82	82,8	loose	10	S	3	,076		
	6.20 P	29,498	56			thick	10	S by E				
	6.55 P	29,516	56	83		thick loose low	10	S by E				
24	0.20 A	29,510	58,5	81,5	81,5	thin	10	SE	3	1,778		(w)
	11.45 P	29,524	58	82	81	thick scat.	8	SE	3	,068		
25	7.20 A	29,512	59	83	84,5	thick	8	ESE	4			
	2.40 P	29,472	53	83	92,5	thick scat.	5	SSW	2			
26	7.35 A	29,508	56,5	83,5	84,5	thick	7	WNW	2	,073		(x)
	2. P	29,482	52,5	84	87	thick	9	SW	2			
	6.20 P	29,471	56	83	83,5	thick	5	SW by S	3	,507		
27	7.15 A	29,470	59,5	84	84,5	thick low	10	SSW <sup>1</sup> W	3			(y)
28	9. A	29,472	57	81,5	79,5	thick low loose	10	SE	3	1,000		(z)
	2.15 P	29,428	58,5	83,5	87,5	thick low	10	SW by W	3	,367		(aa)
29	7.20 A	29,446	56,5	83	86	thick loose gat.	6	S by W				
	2.25 P	29,400	51,5	85	91	thick	9	S by W <sup>1</sup> W	3			
	4.21 P	29,400					9					
30	7. A	29,224	50,5	83	82	thick	8	S <sup>1</sup> W	3	,169		(bb)
										,213		
										15,611		
										7,450		(c)
TOTAL IN JUNE,										-26,061		

(g) Between 10 and 11 P. there was a heavy shower, that produced 2 of this quantity; the rest fell this morning. 2.20 P. A shower just over.

(i) This was the end of the last shower. 2.10 P. A heavy shower about 11 o'clock in the forenoon.

(j) Misty rain. 2.15 P. It cleared soon after last observation.

(l) A shower about 4 o'clock this morning.

(v) About 1 it began to rain in torrents. At  $\frac{1}{2}$  past three 2 inches were measured. At 6 $\frac{1}{2}$  this morning a third; the rest fell since, and a still sprinkles. There was excessively heavy thunder, with most vivid lightning, at 3, though but little wind. 2.20 P. Drizzling rain all day. 6.55 P. A sprinkling about 6.35. Distant thunder.

(w) Soon after last observation it began to drizzle, and the mercury rose, but in a short time after fell again. The rain continued till 1 in the morning, and for about two hours was very heavy. 11.45 P. This fell in the course of the day, about 9 and again 2 P.

(x) A small shower at 7 P. yesterday, and another just over. 2 P. A shower in the forenoon. 6.20 P. A shower about 5 P. and the above produced this water.

(y) The night was clear, and stars bright.

(z) It was very gloomy at 9, with much lightning. About midnight it began to rain; towards morning more, and at 6 A. heavily, and ever since smartly, and so it still rains. 2.15 P. It rained till near noon, and is about to rain more.

(aa) The morning has been bright.

(bb) The rain fell about 8 P. last night in a smart shower from SW wind 5. 2.15 P. This rain fell about 6 P. and was heavy for the time it lasted.

(c) Add this for the overflowing on the 10, 18, 23 and 24, when the garden was all under water.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	July 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	2.50 P	29.436	53	85	92	thick	4	E $\frac{1}{2}$ N	3		
2	7. A	29.483	55.5	83	85	thick	6	E $\frac{1}{2}$ N	4	.148	(a)
	0.10 P	29.510	47.5	83	84	thick loose low	10	ESE	5		
3	9.20 A	29.512	55.5	83	84	thick loose	6	E $\frac{1}{2}$ N	6	.300	(b)
	2.20 P	29.480	55.5	83.3	85	ditto	7	S by E	4	.450	
4	8.12 P	29.556	54.5	82	84	thick	10	SW	4	.069	(c)
	9.30 A	29.586	56.5	83	81.5	thick loose	10	WNW	3	.900	(d)
5	2.30 P	29.528	56	82	83	thick hard	10	SW by S	2	.017	
6	6.22 A	D New									
	7.10	29.486	57	81	78.5	thick loose	10	NW	2	.923	(e)
	2.45 P	29.415	58	82	80.5	loose	10	SW by S	3	.150	
	7. P					ditto	10	SW	7	.500	
7	6.40 A	29.40	58	81	78.7	ditto	9	SW $\frac{1}{2}$ S	3	.359	(f)
9										.300	(g)
										.186	
10	8. A	29.60	61	82	84	thin	6	SE	2		
	7. A	29.654	62	82	83.5	thick thun. col.	5	S	4		
	0.15 P				94	ditto	7	S	4		
	2. P	29.610	62	83.5	88.7	thick thund.	8	SSE	4		(b)
11	7.30 A	29.662	59	83	88	thick scat.	8	S $\frac{1}{2}$ E	2		(i)
12	2.30 P	29.556	56	83.5	90.7	thick	10	SW by S	3	.036	(k)
13	7.30 A	29.516	58	83	82	loose	10	SW by S	2	1.500	(l)
	2.30 P	29.460	58	83	86	thick	10	SSW	3	1.223	
14	6.40 A	29.944	55	81.3	80.7	thick	10	S by W	3	.016	(m)
	7-28 A	D F.Q.									
Carried forward,										7.077	

(a) The night very close and suffocating. After 3 in the morning, thunder and lightning, and a little wind with rain made it possible to sleep. 0.10 P. A heavy storm came on, the wind was NE the greatest part of the forenoon, now has changed.

(b) It rained all the afternoon, and till near 8. P. and is about to rain again. 2.20 P. Flying showers, five or six since last observation.

(c) The produce of several drizzling flying showers after last observation.

(d) About 6 it began to rain, and there were .400 at nine. It has rained almost all night, and there were .500 drawn off just now; it still drizzles. The lightning fell close to the bazar, that is about  $\frac{1}{2}$  of a mile from the house, but did not hurt any body.

(e) Rain in the night with lightning. Heavy rain about day-break, and the shower but just over. 2.45 P. Showers all the forenoon, and now set in. 7. P. It has been a very rainy, windy afternoon, and it still continues so.

(f) It has been tempestuous at times, and rained in flying showers all night.

(g) The 7th in the evening. .186 The 8. to 2. P. when it ceased.

(h) It has thundered at a distance.

(i) There was lightning about 10. P. but not any rain.

(k) This rain fell yesterday about 4 P. It has not rained since.

(l) It rained heavily last night about 11, and it has just begun again gently. 2.30 P. The rain continued till past one.

(m) The rain fell in the evening about 6.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	July 1785. Miscellaneous
				In.	Out.	Kinds.	Quant.	Quarter.	Force.		
15	8.40 P	29.660	58.5	83	87	thick	9	Brought forward.		7.077	(n)
16	2.40 P	29.586	54	85	91	thick	10	SW	4	.072	
17	0.45 P	29.553	55	85	92	thick	7	SW by W	3		(o)
18	2.20 P	29.442	54	83.3	85	thick	10	WSW	5	.184	(p)
19	7.20 A	29.468	57	81	78	thick loose	10	SW by W	3	.340	(q)
21	10.20 P	29.596	60	83	82.5	thin	5	S <sup>1</sup> E	3	.291	(r)
22	5-20 A	Full								.430	
	6.15 A	29.586	64	82	81	thick loose fog.	9	S	2		
24	7- A	29.682	61	80.9	81	thick	9	E by N	4	.110	(s)
	2.20 P	29.650	55	84	90	thick	3	ENE	2	.014	
25	5.45 A	29.675	58.5	81	80	thick	3	SSE	2		
26	8.50 A	29.686	54	84	87.5	thick & thin	8	SSW	2		
	2.30 P	29.627	51	85.6	91.5	thick	9	SE by S	3		(t)
	8.25 P	29.636	54	84	80	thick	8	NW by N	2	1.700	
27	7.20 A	29.641	56.5	83	87	thick	5	S	1	0.007	(u)
	2.20 P	29.613	52.5	84	89.5	thunder	10	SE	4	.025	
28	6.30 A	29.612	58.5	82	84.5	loose	3	S by E	2		
	9-11 A	L. Q.									
29	1.20 P	29.562	52.5	86	91.5	thick	8	ENE	3		
30	8.10 A	29.580	56.5	83.9	87	thick	9	SSE	2		
	2.40 P	29.512	51.5	86.5	93	thick	8	S by W	3		
31	7.15 A	29.528	56	82.3	80.7	thick	9	NL <sup>1</sup> E	3		
	2. P	29.370	58.5	80	79	thick	10	S	4	.226	(w)
										.016	(x)
										10.392	
										1.700	(y)
										12.092	
										Overflowing,	
										TOTAL IN JULY,	12.192

(n) This rain fell the 14th in the night, and not any since.

(o) Rain yesterday evening, and in the night before 3 o'clock.

(p) A very tempestuous night, and rain to day also.

(q) Sprinkling rain.

(r) A fell on the 19th, the rest yesterday. Not any to-day. The forenoon was foggy and cloudy, very close and hot.

(s) This fell the day before yesterday. 2.20 P. A thunder shower at 11. Excessively high tide to-day.

(t) A shower just come on. 8.25 P. Two very heavy showers since 7. P. about which time it began with very heavy thunder from SE, and varied to NW.

(u) The remainder of last night's storm, which was over when the last observation was entered. 2.20 P. A thunder shower about 12, and it now thunders, and more is coming on.

(v) It rains hard. The wind has veered all round the compass at least twice since morning, with flying shower of small rain and distant thunder, of deep and heavy sound.

(x) The wind increased to 8, and blew so for above an hour with rain, of which this is the produce

(y) Add this for overflowing on the 26th, and it could not be less.

M m m z



Day.	Time.	Baromet.	Hygromet.	Thermometer.		Clouds.		Wind.		Rain.	August 1785.	Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.			
1	6. A	29,490	60	81	79,3	thick	3	S by E	3			
2	6.10 A	29,515	62	81,7	81,3	thin & thick	4	SSW	2	0,005	(a)	
	2. P	29,515	57	83,2	88,7	thick thund.	9	SE by S	2			
3	5.40 A	29,561	65	81,5	81,5	thin	2	S by E	2	,715	(b)	
	11. A											
4	5. P.	29,544	57	83	83	thick	5	SE by E	2		(c)	
	7.26 A	D New										
	11. P	29,578	60	82,2	80,9	thin	6	SE	2	,719	(d)	
6	6.30 A	29,528	64,5	80,9	80,9	thick	9	E by N	2			
	11. P	29,588	62	82,3	80,3	thin	5	SW by S	2	,271	(e)	
7	8.30 A	29,580	63	82,3	83	thick	10	W by N	2			
	2.15 P	29,520	61,5	83,7	90,2	thick	9	SSE E	3	,066	(f)	
	11. P	29,600	64	83,5	81	thick	10	S by W	2	1,000		
8	6. A	29,592	62	80,5	78,5	thick	10	S <sup>1</sup> W	2	,546	(g)	
	7.50 A	29,750	63,5	80	79	thick	10	SW	2		(h)	
	0 50 P	29,735	64	80	86	thick hard	8	S	2	,293		
10	6.20 A	29,700	64,5	80,5	81	thick	3	S by E	2			
	1.15 P	29,66	58,5	84,3	90,3	thick thund.	6	SSW	3			
11	9. A	29,638	67,5	83	86,3	thick	5	SSW	3			
	2.15 P	29,574	61,5	86	92,5	thunder	7	S by W	3			
12	7.50 A	29,608	66,5	83,6	87,3	thick	8	S <sup>1</sup> E	2			
	2.15 P	29,564	56	80,5	91,5	thunder	10	S <sup>1</sup> W	2	,070	(i)	
13	7. A	29,606	65	81,5	82,2	thick	9	WNW	3	,014	(k)	
	11.24 A	D F. Q.										
	2.15 P	29,550	63,5	82,8	86,5	thick thund.	10	S by E	2	,400		
14	7.45 A	29,544	64	81,5	82	thick	10	NW	2	,196	(l)	
	2.20 P	29,466	67	84,5	89,5	thick	8	E <sup>1</sup> N	1			
15	7.45 A	29,498	65	82,7	84	thick	6	SSE	3			
	2. P	29,468	61,5	83,5	86	thick thund.	10	E by N	2	,143	(m)	
16	7.45 A	29,528	65	82,8	83,2	thick	5	NE <sup>1</sup> E	3			
	2.15 P	29,460	57,5	85	87,3	thunder	10	NNE	4		(n)	
17	7. A	29,472	64	81	80,2	thick loose	10	NE	2	,475	(o)	
	2.10 P	29,493	61,5	84,5	88,2	thick	8	SW by S	5	,025		
18	6.15 A	29,580	63	80,5	78,5	loose	10	S	3	,583	(p)	
Carried forward.										—	5,521	

(a) About one P. it rained very heavily in town; and very little here: the quantity is noted. 2. P. Distant thunder.

(b) This fell in a very short time. In town there was only a sprinkling.

(c) It was very gloomy in town all the forenoon; and we had two small showers, but not any at the gardens.

(d) Of the water 5 fell last night, the rest in the forenoon to-day.

(e) It rained almost the whole day small rain.

(f) Rain in the forenoon. 11. P. And still raining hard.

(g) It has rained almost incessantly all night long; and still rains, though it is going off.

(h) It rains very heavily. The mercury is in a falling state, so that it has been higher.

(i) This fell in the night about 15. P. and we have had a sprinkling about 11 this forenoon besides.

(k) This fell about 2 in the morning, with a gust of wind and some lightning. 2.15 P. Two or three thunder showers since 9, and it now thunders.

(l) Yesterday afternoon and in the night it rained.

(m) 2. P. Several small showers with thunder.

(n) 2 15 P. Thunder at a distance.

(o) Thunder showers yesterday afternoon, and in the night, and rain this morning. 2.10 P. Shower, all the forenoon of very small rain, and short duration.

(p) It has been a very tempestuous night, with frequent showers. It still rains, and the wind was in general 6 and 7 in the night.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Height 1785- Vejilan va.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
								Brought forward,		5,521	
19	6.50 A	29,578	67	83	84	scattered	5	SSW	4	.142	(7)
	2.30 P	29,564	49	88	90.5	thick	5	SW by W	2		
20	7. A	29,580	63	83	85	thin	9	SW by S	3		
	1.41 P	Full									
	2.20 P	29,566	40	90	93	thick	4	SW by W	4		
21	6.10 A	29,576	54	83	80	thick	5	N	1		
	1. P	29,625	52.5	85	85	thunder	10	NE by E	3		(r)
	2.15 P	29,578	54	84	83	ditto	10	ESE	2	.015	
22	6. A	29,588	58	83	81	thick	9	W by N	1		
	2.15 P	29,556	54	85	90	thick	8	NE by N	4	.052	(r)
23	6.30 A	29,570	61	83	81	thick thund.	9	N	1	.248	(r)
	2.15 P	29,576	59	83.5	86.8	thick	8	SSE	5	.053	
24	7. A	29,596	60	82	82	thick	7	S by E	3	.030	
	2.15 P	29,598	59.5	84	86	thunder	9	S by E	3	.084	(w)
25	6.30 A	29,646	62	82.5	81.5	thick & thin	9	S by E	2		
	2.15 P	29,640	55	85	86.5	thick	9	SSW	2		
26	7. A	29,690	61	82.8	83	thin	9	ESE	2		
	2.15 P	29,642	58	84	81.9	thunder	9	SSE	2	.186	
27	4.05 A	29,700	61	82.5	80	thin & thick	7	SSE	3	.017	(w)
	6.15 A	29,700	57.5	84.5	88.9	thick	9	S by E	3	.004	
28	7. A	29,758	61	82.0	80.9	loose	10	SE by E	2	.200	(s)
29	7. A	29,696	61	81.8	81.8	thick	6	S by E	2	.214	(i)
30	7.10 A	29,704	63	83	83.2	thin	10	SW by S	2	.055	(r)
	2.35 P	29,628	58	85.4	88.5	thunder	9	S by W	2		
31	5.30 A	29,610	61	82	80.7	thick loose	9	W. & W.	1		
	2.25 P	29,600	63	82.5	81	thunder loose	10	W. & W.	2	1,707	(r)
	7. P							Overflow.		1,700	(bb)
										.338	(a)
TOTAL IN AUGUST.										10,661	

(7) Rain about noon yesterday, and after it; and the conclusion of the shower yesterday morning.

(r) 1. P. Thunder at a distance; sprinkling rain began. 2.15 P. Thunder over.

(i) 2.15 P. Rain about 8 A.

(r) Thunder shower since last observation. 2.15 P. Several showers of short duration since last observation. Tides high.

(w) 2.15 P. Several small showers with thunder.

(w) Rain with thunder yesterday afternoon. 2.25 P. A small shower just over.

(r) Rain now falling. It came full in the afternoon yesterday.

(i) Rain yesterday before ten A.M.

(s) Rain in the night. 2.35 P. It has thundered this forenoon, and being then dead calm, the heat was almost insupportable. 2.25 P. The gauge cistern holds only that quantity; how much fell I know not, but I think as much more.

(aa) The water measured to day fell in about an hour. To-day I measured the cistern, and it holds only 1,707; and through the air-hole there runs out one-tenth in 40'. It is impossible, therefore, to ascertain what did fall to-day, but that it had run out was evident, and from circumstances I judge the quantity was as much as was measured.

(bb) Add 1,700, it could not be less, as there was a great deal of water in the garden; and besides, I know from a canal that its water rose 3.4. Yesterday it was 1.6 below the drum, this afternoon the water ran through the drain two inches deep, and yet only three-fourths of rain fell in the afternoon.

(c) This fell in the afternoon.

Day.	Time.	Baromet.	Hygromet.	Thermometer.		Clouds.		Wind.			Rain.	Sept. 1785. Miles from.	
				In.	Out.	Kind.	Quant.	Quarter.	Force.				
1	5.30 A	29.60	68	81.5	80	thick	5	S by W	2				
2	7.40 A	29.70	66.5	82	82.5	thick	5	S	3	.052	(a)		
	2.30 P	29.67	68	83.5	85	thick	10	SSE	3	.156			
3	5.30 A	29.712	71	81.5	79.9	thick	3	SSE	1				
	2.20 P	29.700	65	83	86	thick	6	S by W $\frac{1}{2}$ W	3				
	10.51 P	D New											
4	6. A	29.748	69	82	79.9	thin	5	S by W	1				
	2.20 P	29.730	50.5	85	92	thick	6	S by W	2				
6	6.15 A	29.772	55.5	83.5	82	thick scatter.	6	SSW	2				
	2.25 P	29.734	46.5	88	91	thunder	7	SW by W	4		(b)		
7	5.40 A	29.720	55	84	82.2	thin & thick	6	SSW	3				
	2.30 P	29.714	45	87.5	89	thunder	9	SSW	3		(c)		
8	5.40 A	29.716	55	84	81	thin	3	S by W	2		(d)		
9	5.40 A	29.740	55	83	82	thin	3	S $\frac{1}{2}$ W	1				
	2.10 P	29.730	45	87.5	92	thunder	5	SW by W	2		(e)		
10	7.30 A	29.820	54	84.8	85	thin & thick	6	S by E	2		(f)		
	2.25 P	29.784	48	88	92	thunder	9	SSW	3				
11	7. A	29.782	55.5	83	81.5	thick	9	N by E $\frac{1}{2}$ N	2				
	2. P	29.754	50.5	86	88.5	thunder	10	SW by S	3		(g)		
12	1.55 A	D F. Q.											
	6.10 A	29.720	55	83.5	80.2	thunder	6	SW $\frac{1}{2}$ S	2	.582	(h)		
	2.10 P	29.668	53.5	86	92	thick	9	S	2	.185			
13	5.55 A	29.650	57	84	82	thick	7	S by W	2		(i)		
	1.20 P	29.592	55	87	93	thick heavy	9	SSE	2				
14	7.10 A	29.655	56.5	83.3	81.9	foggy	10	ESE	2	.010	(k)		
	2.10 P	29.608	52	86	89.5	thunder	8	SE by S	4	.002			
15	5.50 A	29.600	56.5	82	80	loose	7	E by N	3	.001	(l)		
16	7.15 A	29.648	56.5	82	81	thin	4	E by S $\frac{1}{2}$ S	3	.128	(m)		
	2. P	29.616	54	84	86	thunder	5	E $\frac{1}{2}$ S	2	.590			
	8.40 P	29.659		83	82	thin	5	SE by E	3	.110			
17	6. A	29.630	59	82	80	thin	9	SE by E	2	.003	(n)		
	2.25 P	29.628	54	85	82.5	thick	10	E by N $\frac{1}{2}$ N	1	.001			
Carried forward,											-	1,820	

Carried forward, - 1,820

(a) A shower about 1 in the morning, with violent wind. 2.30 P. A shower about 10.

(b) Distant thunder.

(c) 2.30 P. We had a sprinkling of rain at 11, and some thunder since.

(d) Yesterday it rained hard at Dundum, and to-day there was a very smart shower in Calcutta; only a sprinkling here.

(e) 2.10 P. Distant thunder, but approaching from the SW to SSE.

(f) About and until sun set we had a double rainbow, but the rain was only in scattered drops.

(g) 2. P. Loud thunder in the NE.

(h) At  $\frac{1}{2}$  past 4 we had heavy rain from the SW. with lightning. 2.10 P. Rain about 9 o'clock.

(i) A sprinkling just over.

(k) We had a great deal of thunder last night, sprinkling rain and dead calm till day-break.

2.10 P. We had two or three sprinklings, and some thunder.

(l) A sprinkling in the afternoon about 3. P.

(m) This water fell yesterday, and it did not rain in town. 2. P. At  $\frac{1}{2}$  past 12 a very heavy shower gave this water in less than 20 from SE 5. 8.40 P. This water fell about sun-set, from which time the sky began to clear.

(n) This fell in the night. 2.25 P. A sprinkling in the forenoon.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Sept. 1755. Miles per hour.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
18	6. A	29,648	58	81	80,5	loose	8	Brought forward,		1,820	
	7. A	29,664	58	81	80	loose	10	E by N; N	2		(o)
	2.20 P	29,613	56	84	85	loose	10	ditto	2		
	9.57 P	Full				loose	10	S by E	3	,056	
19	6. A	29,590	59	81	80	thick loose	10	E by S	2	,003	(p)
	2.15 P	29,588	61	83	87,2	thick heavy	10	S by W	2	,002	
20	6. A	29,580	62	81	80	thick loose	10	SE	2	,281	(q)
	2. P	29,576	59	84,5	89	thick	8	S by E	3	,163	
21	7.50 A	29,687	61	81	81,5	thick	9	E by S	4	,387	(r)
	2.25 P	29,666	60,5	84,3	87	thick	10	SE by S	4	,084	
22	6. A	29,754	62	81	79,8	thick	3	E by N	4	,016	(i)
23	7. A	29,756	62	80	80,6	thin	4	NE	1	,270	
	1.30 P	29,728	58	84,7	88,8	thick	6	NW	1		(e)
24	8.15 A	29,723	62	83	84,5	thick	9	NW	3		
	2.15 P	29,636	55	86	89,5	thick	8	NNW	3		
25	8.50 A	29,668	58	83	84	thick	5	E by S	4		(n)
	2.15 P	29,583	53	84,3	86	thick	7	ESE	4	,154	
	2.21 P	L. Q.									
26	8. A	29,666	58	80,8	81,2	thick loose	5	ENE	3	,395	(w)
	2. P	29,608	58	82	84	thick	9	SSE varying to S by W	5	,291	
27	7.45 A	29,641	61	81	81,8	thin	5	SE	3	,018	(x)
	2.25 P	29,573	59	82	81	thick	10	SW	3	,130	
28	7.20 A	29,600	60	81	81	thick	9	SE by S	5	,130	(j)
	2.15 P	29,556	62	83	85,5	thick	10	SSE	5	,009	
29	6.30 A	29,638	63	81	79,5	thick	10	S by E	2	,260	(z)
30	6.30 A	29,680	61	78,2	79,9	thick hard	4	SW $\frac{1}{2}$ W		,182	(aa)
	12. P									,001	
TOTAL IN SEPTEMBER, -										7,032	

(o) 7. A. A small rain. 2.20 P. Rain in the forenoon, several small showers.

(p) This fell yesterday before sun-set. 2.15 P. Rain in a short sprinkling this forenoon.

(q) Rain yesterday evening, and in the night: it still rains scattered large drops. 2. P. Rain in the forenoon.

(r) Rain with thunder at 5. P. again in the night twice, and since day also. 2.25. P. Two or three showers since last observation.

(i) Rain in the afternoon yesterday. Rain twice to-day.

(j) 1.30 P. The wind has varied round and round, though hardly perceptible.

(w) The night was dead calm till about an hour before dawn, and then we had a storm from the NE. with lightning. 2.15 P. A shower just over.

(n) Rain at 4. A. and again at sun-rise. 2. P. Flying showers all the forenoon.

(a) Rain yesterday afternoon. 2.25. P. Several smart showers since last observation.

(x) A very stormy night, with frequent showers. 2.15 P. Two or three showers since morning but all momentary, and small.

(z) Before 11 o'clock P. we had rain 15. Between 12 and 1 there came on a violent rain, attended with thunder, lightning, and wind, which varied round and round; it produced 1,25, but the three 1,20, and the rest since. It still lowers, and threatens.

(aa) Several showers yesterday, and one in the night. 12. P. A sprinkling to-day.

Day.	Time.	Baromet.	Hg: 72 in.	Thermometer.		Clouds.		Wind.		Rain.	Obs. 1785.	Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.			
1	8. A	29.826	58.5	81.2	81.5	thin	4	WNW	2			
	2.10 P	29.770	50	84	87.5	thin	2	W by S	3			
2	7.45 A	29.840	56.5	80.5	80.5			SW $\frac{1}{2}$ S	2			
	2.20 P	29.797	37	81	86			WNW	3			
3	6.15 A	29.790	53	80.5	82	thin	7	SW by S	2			
	3.54 P	29.764	46	84	84.5	thunder	5	WNW	3			(a)
4	7.15 A	29.845	54	81	80	thick scat.	4	NW	2			
	2.20 P	29.824	49	84.3	87.3	thick	6	WNW	2			(b)
5	7.30 A	29.875	54	82	81.5	thin	2	SE by S	2			
	2.15 P	29.833	43	86	90.5	thick	6	SSW	2			
6	6.50 A	29.910	52	82	79	thin	1	S	1			
7	6. A	29.872	51	82	81.5			SW				
	7.40 A	29.790	45	86	89.5	thick	6	WNW	2			
8	2.30 P	29.858	50	81	73	thunder	8	E $\frac{1}{2}$ N	1	.331		(c)
	2.30 P	29.773	45	85	88.5	thick thund.	8	NE	2			
9	6. A	29.86	52	80.5	78	thick	3	NE	2	.735		(d)
	2.25 P	29.799	50	81.7	87.5	thunder	9	S by E	3	.455		
10	10.30 P	29.873	55	78.2	75.5	thick	4	ENE	2	.002		(e)
11	6.15 A	29.907	56	80.5	78.6	thick scat.	7	E	2			
	2.20 P	29.863	52	84	88.5	thick	6	NNE	3			
	2.46 P	29.902	55	81.2	81	thin	2	WN	1			(f)
12	7.15 A	29.868	47	81.3	87.5	thick	6	NW	1			
	2.25 P	29.900	53	81.5	79	thin	2	NW $\frac{1}{2}$ W	2			
13	6.30 A	29.894	53	81.5	80			W by S	2			
14	7. A	29.848	46	84	88.9	thick	8	WNW	2			
	2.20 P	29.892	53	82	79.9	thunder	3	NW by W	2			
15	7. A	29.878	45	86	89	thick thund.	6	NW $\frac{1}{2}$ N	3			(g)
	2.15 P	29.848	52	81.5	80	thin	4	N	2			
16	6.45 A	29.897	46	86	88.5	thick	6	N	3			
	2.25 P											
Carried forward,										- 1.391		

(a) 5.30 P. Rain in the North.

(b) 2.20 P. Very sultry.

(c) There was much lightning in the North, with distant thunder, and at 4 we had a thunder shower.

(d) A thunder shower about sun-set. 2.25 P. Rain began at 3, and continued till near 9; it came from the NE. with a very sudden change.

(e) Whether this was rain or dew I do not know.

(f) At 6.30 A. The thermometer out of doors 78.7.

(g) Thunder at a distance twice this morning.

Day	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
17	6.20 A	29.928	50	80.7	78.2			Brought forward.		1.391	
	2.5 P	29.885	42.5	85	86.5			N by E $\frac{1}{2}$ E	2		(b)
18	6.46 A	29.914						N	4		
	2.30 P	29.878		79				N	1		(i)
	6.50 A	29.914		86				N	3		
	2.30 P	29.872		79				NNE	2		
19	6.30 A	29.872		86				N	1		
	2.30 P	29.856		80		thick	10	N	2		(k)
20	7.30 A	29.900		86		thin	5	N	2		
	2. P	29.832		81.7		thin	3	N Eastly	3		
21	8. A	29.92		87.5		thick & scat.	5	N	4		
	2.30 P	29.864		78				N	3		
22	6.20 A	29.884		87				NNE	4		
	2.40 P	29.828		77.5		thin	4	N	3		
23	6.20 A	29.892		87		thin	3	NE	3		
	2. P	29.864		79.5		thin	6	NNE	2		
24	7.10 A	29.936		85.5		thin	4	NNE	2		
	2. P	29.903									
25	4.45 A	29.913		78.5		thin	4	NE	9		
	6.30	29.900		88		thick scat.	3	N	2		
26	2.10 P	29.874		80.5		thick & thin	4	NE	2		(l)
	6.40 A	29.860		86		thunder	8	SE	1		
	1. P	29.866		86		thunder	9	SE	4		
	1.25 P					thunder	10	SE	6		
27	7. A	29.840		78.5		thick loofe	10	NNE	1	.920	(m)
	2. P	29.780		83		thick	10	NE	2	.456	
28	7. A	29.724		77		loofe foggy	9	NNE	3		
30										.084	(n)
31										.012	(o)
TOTAL IN OCTOBER,										-2.863	

(b) 2.5 P. Quitted the gardens this evening.

(i) First observation in Calcutta.

(k) The clouds began to collect yesterday about 9 A.

(l) Foggy. 1 P. Distant thunder. 1.25 P. Do. and rain coming on. 1.40 P. Rain began in large drops.

(m) The rain fell heavily, and continued till about three, and produced the water above at the gardens. It has rained in the night, and I heard it at day-break, and it drizzles now 2 P. Smart rain. This water was measured in the morning.

(n) Rain at day-break.

(o) Rain at noon.

Day.	Time.	Baromet.	Hygromet.	Thermometer.		Clouds.		Wind.		Rain.	Nov. 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
2	7.15 A	29.947		80		thick	4	N	1		
	9.33 A	D New									
	2.30 P	29.912		85.5		thick	8	ESE	3		
3	8.30 A	29.904		80				N	2	.003	(a)
4	8.15 A	29.936		79.3		thick	6	NE	3		
	2.30 P	29.840		81.7		thick	8	E	3		
5	9. A	29.924		78.3		thick	10	N	3	.001	(b)
	2.20 P	29.802		82.3		thick	9	N	2		
6	6.40 A	29.850		78		thick	8	E	1	.019	(c)
	2.20 P	29.820		81.8		thick	10	NE	1		
7	7.40 A	29.914		78.3		studded	6	N	2		
	2.15 P	29.900		83		thick	8	NNE	2		
8	7. A	29.932		78.8		thick	10	NE	1		(d)
	2.10 P	29.881		79.5		thick	10	NF	3		
9	7. A	29.940		74.3		thick	9	N	2	1.000	
	2.10 P	29.896		77		thick	8	NNE	3		(e)
10	1.43 A	D F. Q.									
	7.40 A	29.936		73		none		N	2		
	2. P	29.936		77.8		white scat.	3	NW	2		
11	7. A	30.022		74				N	2		
	2. P	29.988		80		thick white sc.	6	NW	2		(f)
12	8. A	30.118		75		thick	3	NNE	2		
	2.30 P	30.036		79.3		thick	4	NNE	2		
13	8. A	30.118		74.3		thick	3	N	3		
	2. P	30.062		79		scattered	3	N	4		
14	7. A	30.082		71				N	3		
	2.25 P	30.024		78				NNW	3		
15	7.35 A	30.005		70.5				NW	3		
Carried forward.										—	1.023

(a) A small shower at the gardens.

(b) Small rain - the produce at the gardens.

(c) It rained last night, and the water was measured this morning at the gardens. 2.20 P. At noon there was a smart shower of rain.

(d) Very gloomy and about to rain. 2.10 P. It began to rain about 8 o'clock, and it continued till near two. The sky begins to brighten a little.

(e) Yesterday at 3 P. it began to rain, and about 4 P. to blow, and the wind increased to great violence from the N and NE. About 7 P. a blast broke the pipe of the water-gage, at which time there was 0.5 in the cistern; and the quantity that fell afterwards was estimated at 0.5. The rain was heavy at times, and continued till one the next morning.

(f) Thick fog going off.

Day.	Time.	Baromet.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Miles.	1785.	Miles.
				In.	Out.	Kind.	Qty.	Quarter.	Force.				
16	6.40 A	29.944		69.7				Brought forward.		1.023			
	4.44 P	29.944						NW	2				
17	7.30 A	29.960		71.3	72.3			NW	2			(g)	
	2.20 P	29.960		78.3				N	2				
18	7.45 A	30.036		72.5		thin		E	2			(b)	
	2.15 P	30.013		78		scattered	3	WNW	2				
19	7.20 A	30.073		72		thick & thin	4	W	2				
	2.10 P	30.023		78.5		thin	7	WNW	3				
20	2.15 P	30.040		77.7		thin	3	NW	3			(c)	
21	7.20 A	30.072		71.3		thick	9	N	2			(k)	
	2.10 P	30.070		78		thick	6	E	2				
22	6.40 A	30.038		71.5		thick	9	ENE	4			(l)	
	1.50 P	30.020		78		scattered	7	ENE	3				
23	7. A	29.986		72	67	thin	3	N	2				
	11.06 P	29.986											
24	8. A	29.976		73		thick	10	NE	3				
	2. P	29.920		79.5		thin	6	N	2				
25	7.30 A	29.942		72		thin	4	N	3				
28	6.20 A	29.942			59.7			N	4			(m)	
	7.10 A	30.050		66.2	59.3	thin, a stripe in the east		N	4				
	2. P	30.000		73		none		N	3				
29	7.25 A	30.022		66.5	58	none		N	3			(n)	
	2.10 P	29.963		75.5				N	3				
30	6.40 A	29.977		66	59			N	3				
	2.30 P	29.940		77.3				NNW	3				
TOTAL IN NOVEMBER,										1.023			

(g) The thermometer out was in the sun.

(b) Thin fog.

(c) This morning was very cold, but I did not observe.

(k) It rained about three in the morning.

(l) Very sharp wind abroad.

(m) One very small cloud. 7.10 A. Foul sky in the West. 2. P. Not a single cloud to be seen; the small stripe went off before 8, and the whole day has been delightfully pleasant.

(n) Yesterday ended as delightful as it was at noon; and to-day promises to be just as fair and pleasant.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Dec. 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.	Inches.	
1	6.45 A	29.988		66.5	61	thin	2	W	2		
	2. P	29.976		78.2		scattered	3	NW	2		
2	2.42 A	D New									
	7.15 A	29.956		67	62	thin & thick fcs	5	W	2		
	2. P	29.944		77.5				WNW	4		
3	2. A	30.00		69	64	thin	4	WNW	2		
	2.20 P	29.86		77		thin	4	N	2		
4	7. A	30.032		66.4	59			N	2		
5	7. P			65				N	2		(a)
	2. P				74			WNW	2		
6	7.10 A	29.070		68				WSW	2		(b)
7	7. A			67.5				WSW	3		(c)
8	6.40 A			68				WNW	2		
9	6.30 A			52							(d)
	10.46 A	D F. Q.									
	2.20 P	30.044		79.5	77.5			WNW	3		
10	6.30 A	29.966		57	51						(e)
15	11. P	30.060		58							
16	4.30 A	D Full									
	6. A	30.050		53	48.5			NNW	3		
	2. P	30.040		76.3	74.8			W	1		

(a) At *Parre Baugh*.

(b) Foggy.

(c) Foggy.

(d) At *Dundum* in tent: thermometer wet with the dew.

(e) Very thick fog.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Dir. 1785. Miles per hour.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
17	6. A	29.977		62	53	thick	8				
	2. P			67	73	thick	5	NW	2		(f)
18	6. A			62	73	thin	5	NW	2		
19	6. A	2 63		67	52	thin	5	N	2		
	2. P	2 44		78	78	thin	6	N	3		
20	2 20 P	2 176		77	78	thin & thick	6	ENE	3		(g)
21	7. A	30.00		58	53	thick	4	E	3		(v)
	2. P	29.944		78.5	77.5	thick	8	NE	2		
22	6 30 A	30.012		57.8	53			N	2		
	1. P	30.025		79.5	76	thick	9	N	3		
23	7-20 A	30.003	45	64.5	61	none		NNE	2		
	2.35 P	29.965		72	75			NNW	2		(v)
	8 01 P	29.965									
24	7. A	30.024	43	67	60			NW by N	3		
25	6 40 A				59.5			NNE	3		
26	6.30 A				55			NW	2		
27	6.30 A				55			WNW	2		
	2 30 P	29.934			73			WNW	3		
29	8. A	30.088		69	59			NW by W	2		
	2.40 P	30.002		71.2	71.7			WNW	3		
31	6.31 P	D New									

(f) Last night the wind was South of the West. At the gardens.

(g) In the morning it was E. 4

(b) Excessive fog, but going off.

(v) At the gardens.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Jan. 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	7. A	30,128		72,5	60			WNW	2		
3	8. A	30,116		70	63,5			W <sup>1</sup> S	2		(a)
4	8. A	30,114		69,7	62,5	thin	5	W by N	2		
	1.10 P	30,064		71,5	74	thin	6	WNW	2		
5	8.48 A	30,144		69,5	66,5	thin	2	NW	3		
6	8. A	30,212		69	61			N	3		
	2.30 P	30,172		75,5	75			N <sup>1</sup> W	4		(b)
7	8.10 A	30,248		68,5	59			NNW	3		
	6.37 P	☾ First									
11	2. P	30,042		69,5	73,5			N	3		
12	9. A	30,107		64	61	thin	2	NW	3		
	3. P	30,004		72	73	thick	3	NW by N	2		
13	8.30 A	30,078		59,5	66,5	none		NW	3		(c)
	2.15 P	29,998		69	73			WNW	2		
14	8. A	30,124		67,6	57			NW	3		
	2.15 P	30,074		70	72,5			WNW	3		
	6.30 P	☾ Full									
15	7.30 A	30,124		66	56,5			NW <sup>1</sup> N	3		
	2.30 P	30,050		70,5	72,3			NW by N	3		(c)
16	6 A				52			NW	3		
	2.20 P				78			NW	3		

(a) A fog so thick hardly any thing is visible.

(b) To-day at day-break it was 52 at *Dumdum*.

(c) Foggy, and piercing by cold.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Jan. 1786. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
17	6. A	30,040	66,5		50			NNW	3		
	2. P				79			NW	3		
18	6. A				49			NW	0		(d)
19	7. A				56,5			NW	2		(e)
	2.20 P				82			WNW	4		
20	6.30 A	D Laft			50			W	4		
	2. P				80			W	4		
22	5.42 P										
23	6. A				47			N	3		(f)
24	6. A				50			ENE	2		
25	6. A				60			S	2		
26	7. A				68			NW	2		
	2. P				84						
27	8. A				64						
	2. P				87			W	1		
29	7 45 A	D New			65			NE	3		(g)
	2.50 P				85			NNE	3		
30	8.32 A				64	thick scat.	4	WSW	1		(b)
	2.35 P				83			NNE	4		

(d) Fog, and thermometer wet: the air mild to the feeling.

(e) Foggy.

(f) Thermometer wet with dew.

(g) Thermometer wet with dew.

(b) Sun eclipsed, going off.

Day.	Time	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Feb. 1786.	Miscellaneous.
				In.	Out	Kind.	Quant.	Quarter.	Force.			
1	7.15 A	20.99+		72.3	67	thick	3	SW	2		(a)	
2	6.50 A	29.927		69.5	66			SSW	3		(b)	
3	7.45 A	30.036		67.5	63.5			N by W	3			
	2.30 P	30.009		76	75			NW	4			
4	6.30 A	30.047		67	55			WNW	3			
	2.30 P	30.070		77	75			NW by W	4			
6	2.22 A	1) First										
	6.40 A	30.100		67	53.5			W	3			
	2.50 P	30.078		78	77			NW	4			
7	7.00 A	30.078		66	57.5			NW 1/2 N	3			
	3.30 P	30.020		73	77.5			NW 1/2 N	3			
8	7.15 A	30.068		66	59			NW 1/2 N	3			
10	6.50 A	30.084		68	58			WNW	3			
	2.40 P	30.047		79	79.3			W by N	3			
11	6.50 A	30.094		69	59			W by N	3		(c)	
	2.30 P	30.026		71	80.7			E 1/2 S	3			
12	7.50 A	30.00		69.3	65.5			N	2			
13	7.30 A	30.00		73.2	68.3			SW by S	2		(d)	
	10.35 A	1) Full										
	2. P	29.956		80.5	81.3			SW	2			
14	5.50 A	29.970		71.5	66			SE	2		(e)	

(a) Excessive fog.

(b) Thick fog rising into clouds.

(c) Foggy.

(d) Excessive fog.

(e) Excessive fog.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Remarks.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
15	1.40 P				86	thick	6	S	4		
16	7. A				64	ditto	3	ESE	2		(f)
	2.10 P	29.914		76	79.5	thunder	10	SSW	2		(g)
	6. P									1600	
17	7.50 A	29.952		70.3	64.3	thick	10	SE	5	14200	(h)
18	7.40 A	29.992		65.5	61.3	thick scat.	5	NNE	3	1750	(i)
19	8.10 A	30.02		65	65			WNW	4		
21	7.40 A	29.892		69	65.4			SW $\frac{1}{2}$ S	3		
	2.11 P	29.882		77	77	thick thund.	7	S	3		(k)
22	6. P	29.882		74	75	thick	10	SSW	3		(l)
23	8. A	29.970		76	80.8	ditto	6	NW	3	1810	(m)
24	2.30 P	29.982		74	73.5			S by E	2		
25	8. A	30.062		78	82	thick	4	ENE; N	2		
	2.30 P	30.000		73	69.3	ditto	10	NNW	2		(n)
26	7.15 A	30.076		78.5	80.5	ditto	10	W by E	3		
	2.30 P	30.066		72.5	70.3	ditto	10	NW	2		
27	7.10 A	30.095		77	85	thunder	6	W	2		(o)
28	2.20 P	30.058									
	8.20 P	New									
TOTAL IN FEBRUARY, 1855										0.936	

(f) The clouds have been thick 9, and looked as if it was about to rain.

(g) Foggy (at Dundun). 2.10 P. (At the garden) thunder coming on, and drawing near. G. P. Rain had begun in drops when last observation was made. There was thunder, but not any thunder squall.

(h) It has been a very tempestuous night, with excessively heavy thunder, and of very long continuance; the thunder shook the whole house several times.

(i) This fell in the last night

(k) The wind has been S. 6 the greatest part of the day.

(l) It lightened a good deal till 8. P. and then cleared suddenly.

(m) This water fell in a thunder shower last night, from the W and NW. with much lightning, though but little wind.

(n) Much lightning in the former part of the night, and a gust of wind from N. about 14.

(o) Very heavy fog this morning, and a mists forming.



# ASIATIC RESEARCHES;

OR

## TRANSACTIONS,

OF THE

### SOCIETY

*INSTITUTED IN BENGAL,*

FOR INQUIRING INTO THE

HISTORY AND ANTIQUITIES, THE ARTS, SCIENCES,  
AND LITERATURE,

OF

A S I A.

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*VOLUME THE SECOND.*

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AND J. SCATCHERD.

1799.





## ADVERTISEMENT,

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IT may greatly conduce to the advancement of useful knowledge, if the learned Societies established in *Europe* will transmit to the Secretary of the Society in *Bengal* a collection of short and precise Queries on every branch of *Asiatic* History, Natural and Civil, on the Philosophy, Mathematics, Antiquities, and Polite Literature of *Asa*, and on eastern Arts, both liberal and mechanic; since it is hoped that accurate answers may in due time be procured to any questions that can be proposed on those subjects; which must in all events be curious and interesting, and may prove in the highest degree beneficial to mankind.



# ASIATIC RESEARCHES.

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## I.

### THE FOURTH ANNIVERSARY DISCOURSE,

DELIVERED 15 FEBRUARY, 1787.

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BY THE PRESIDENT.

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GENTLEMEN,

I HAD the honour last year of opening to you my intention to discourse at our annual meetings on the *five* principal nations who have peopled the continent and islands of *Asia*; so as to trace, by an historical and philological analysis, the number of ancient stems from which those five branches have severally sprung, and the central region from which they appear to have proceeded: you may therefore expect that, having submitted to your consideration a few general remarks on the old inhabitants of *India*, I should now offer my sentiments on some other nation, who, from a similitude of *language, religion, arts, and manners*, may be supposed to have had an early connection with the *Hindus*. But since we find some *Asiatic* nations totally dissimilar to them in all or most of those particulars; and since the difference will strike you more forcibly by an immediate and close comparison, I design at present to give a short account of a wonderful people, who seem in every respect so strongly contrasted to the original natives of this country, that they must have been for ages a distinct and separate race.

FOR the purpose of these discourses, I considered *India* on its largest scale, describing it as lying between *Persia* and *China*, *Tartary*, and *Java*; and for the same purpose, I now apply the name of *Arabia*, as the *Arabian* Geographers often apply it to that extensive peninsula which the *Red Sea* divides from *Africa*, the great *Affyrian* river from *Iran*, and of which the *Erythrean Sea* washes the base, without excluding any part of its western side, which would be completely maritime, if no isthmus intervened between the *Mediterranean*, and the *Sea of Kelzon*: that country, in short, I call *Arabia*, in which the *Arabic* language and letters, or such as have a near affinity to them, have been immemorially current.

ARABIA, thus divided from *India* by a vast ocean, or at least by a broad bay, could hardly have been connected in any degree with this country, until navigation and commerce had been considerably improved: yet as the *Hindus* and the people of *Yemen* were both commercial nations in a very early age, they were probably the first instruments of conveying to the western world the gold, ivory, and perfumes of *India*, as well as the fragrant wood, called *aluvotia* in *Arabic*, and *aguru* in *Sanscrit*, which grows in the greatest perfection in *Anam* or *Cochinchina*. It is possible too, that a part of the *Arabian* idolatry might have been derived from the same source with that of the *Hindus*; but such an intercourse may be considered as partial and accidental only; nor am I more convinced than I was fifteen years ago, when I took the liberty to animadvert on a passage in the History of Prince KANTEMIR, that the *Turks* have any just reason for holding the coast of *Yemen* to be a part of *India*, and calling its inhabitants *Yellow Indians*.

THE *Arabs* have never been entirely subdued; nor has any impression  
been

been made on them, except on their borders; where, indeed, the *Phœnicians*, *Persians*, *Ethiopians*, *Egyptians*, and, in modern times, the *Othman Tartars*, have severally acquired settlements; but, with these exceptions, the natives of *Hejâz* and *Yemen* have preserved for ages the sole dominion of their deserts and pastures, their mountains and fertile valleys: thus, apart from the rest of mankind, this extraordinary people have retained their primitive manners and language, features and character, as long and as remarkably as the *Hindus* themselves. All the genuine *Arabs* of *Syria* whom I knew in *Eusebe*, those of *Yemen*, whom I saw in the *Isle of Himaueu*, whither many had come from *Masbat* for the purpose of trade, and those of *Hejâz*, whom I have met in *Bengal*, form a striking contrast to the *Hindu* inhabitants of those provinces: their eyes are full of vivacity, their speech voluble and articulate, their deportment manly and dignified, their apprehension quick, their minds always present and attentive; with a spirit of independence appearing in the countenances even of the lowest among them. Men will always differ in their ideas of civilization, each measuring it by the habits and prejudices of his own country; but, if courtesy and urbanity, a love of poetry and eloquence, and the practice of exalted virtues, be a juster measure of perfect society, we have certain proof that the people of *Arabia*, both on plains and cities, in republican and monarchical states, were eminently civilized for many ages before their conquest of *Persia*.

It is deplorable that the Ancient History of this majestic race should be as little known in detail before the time of *Dr. Yezen* as that of the *Hindus* before *Pieramditva*; for although the vast historical work of *Al-nureari*, and the *Mur'juhthahab*, or *Golden Meadows*, of *Al-hafid*, contain chapters on the kings of *Himyar*, *Ghafir* and *Ilah*, with lists of them.

and sketches of their several reigns; and although Genealogical Tables, from which chronology might be better ascertained, are prefixed to many compositions of the old *Arabian* Poets, yet most manuscripts are so incorrect, and so many contradictions are found in the best of them, that we can scarce lean upon tradition with security, and must have recourse to the same media for investigating the history of the *Arabs*, that I before adopted in regard to that of the *Indians*; namely, their *language*, *letters*, and *religion*, their ancient *monuments*, and the certain remains of their *arts*; on each of which heads I shall touch very concisely, having premised, that my observations will in general be confined to the state of *Arabia* before that singular revolution at the beginning of the *seventh century*, the effects of which we feel at this day from the *Pyrenean Mountains* and the *Danube*, to the farthest parts of the *Indian Empire*, and even to the *Eastern Islands*.

I. For the knowledge which any *European* who pleases may attain of the *Arabian* language, we are principally indebted to the university of *Leyden*; for, though several *Italians* have assiduously laboured in the same wide field, yet the fruit of their labours has been rendered almost useless by more commodious and more accurate works printed in *Holland*; and, though Pocock certainly accomplished much, and was able to accomplish any thing, yet the *academical* ease which he enjoyed, and his theological pursuits, induced him to leave unfinished the valuable work of *Maidnû*, which he had prepared for publication; nor even, if that rich mine of *Arabian* philology had seen the light, would it have borne any comparison with the fifty dissertations of *Hariri*, which the first ALBERT SCHULTENS translated and explained, though he sent abroad but few of them, and has left his worthy grandson, from whom perhaps *Maidnû* also may be expected the honour of publishing the rest: but the palm of glory in this branch of litera-

ture

ture is due to GOLIUS, whose works are equally profound and elegant; so perspicuous in method, that they may always be consulted without fatigue, and read without languor; yet, so abundant in matter, that any man, who shall begin with his noble edition of the Grammar compiled by his master ERPENIUS, and proceed, with the help of his incomparable Dictionary, to study his History of *Taimûr* by *Ibni Arabsháh*, and shall make himself complete master of that sublime work, will understand the learned *Arabic* better than the deepest scholar at *Constantinople* or at *Mecca*. The *Arabic* language, therefore, is almost wholly in our power; and, as it is unquestionably one of the most ancient in the world, so it yields to none ever spoken by mortals in the number of its words and the precision of its phrases; but it is equally true and wonderful that it bears not the least resemblance, either in words or the structure of them, to the *Sanscrit*, or great parent of the *Indian* dialects; of which dissimilarity I will mention two remarkable instances; the *Sanscrit*, like the *Greek*, *Persian*, and *German*, delights in compounds, but in a much higher degree, and indeed to such excess, that I could produce words of more than twenty syllables, not formed ludicrously, like that by which the buffoon in ARISTOPHANES describes a feast, but with perfect seriousness, on the most solemn occasions, and in the most elegant works; while the *Arabic*, on the other hand, and all its sister dialects, abhor the composition of words, and invariably express very complex ideas by circumlocution; so that, if a compound word be found in any genuine language of the *Arabian* peninsula (*zenmerduh* for instance, which occurs in the *Hamásah*) it may at once be pronounced an exotic. Again: It is the genius of the *Sanscrit*, and other languages of the same stock, that the roots of verbs be almost universally *biliteral*, so that *fifty-and-twenty hundred* such roots might be formed by the composition of the



*fifty Indian letters*; but the *Arabic* roots are as universally *triliteral*; so that the composition of the *twenty-eight Arabian* letters would give near *two-and-twenty thousand elements* of the language: and this will demonstrate the surprising extent of it; for, although great numbers of its roots are confessedly lost, and some, perhaps, were never in use, yet, if we suppose ten thousand of them (without reckoning *quadriliterals*) to exist, and each of them to admit only *five* variations, one with another, in forming *derivative nouns*, even then a perfect *Arabic* dictionary ought to contain *fifty thousand* words, each of which may receive a multitude of changes by the rules of grammar. The derivatives in *Sanscrit* are considerably more numerous; but a farther comparison between the two languages is here unnecessary; since, in whatever light we view them, they seem totally distinct, and must have been invented by two different races of men; nor do I recollect a single word in common between them, except *Suruj*, the plural of *Siraj*, meaning both a *lamp* and the *sun*, the *Sanscrit* name of which is, in *Bengal*, pronounced *Sárja*; and even this resemblance may be purely accidental. We may easily believe with the *Hindus*, that *not even INDRA himself and his heavenly bands, much less any mortal, ever comprehended in his mind such an ocean of words as their sacred language contains*; and with the *Arabs*, that no man uninspired was ever a complete master of *Arabic*. In fact no person, I believe, now living in *Europe* or *Asia*, can read without study an hundred couplets together in any collection of ancient *Arabian* poems: and we are told, that the great author of the *Kánuís* learned by accident from the mouth of a child, in a village of *Arabia*, the meaning of three words, which he had long sought in vain from grammarians, and from books, of the highest reputation. It is by approximation alone that a knowledge of these two venerable languages can be acquired; and, with moderate

atten-

attention, enough of them both may be known, to delight and instruct us in an infinite degree. I conclude this head with remarking, that the nature of the *Ethiopic* dialect seems to prove an early establishment of the *Arabs* in part of *Ethiopia*, from which they were afterwards expelled, and attacked even in their own country by the *Abyssinians*, who had been invited over as auxiliaries against the tyrant of *Yemen*, about a century before the birth of MUHAMMED.

OF the characters in which the old compositions of *Arabia* were written, we know but little, except that the *Koràn* originally appeared in those of *Cufic*, from which the modern *Arabian* letters, with all their elegant variations, were derived, and which unquestionably had a common origin with the *Hebrew* or *Chaldaic*; but, as to the *Himyarick* letters, or those which we see mentioned by the name of *Almusalad*, we are still in total darkness, the traveller NIEBUHR having been unfortunately prevented from visiting some ancient monuments in *Yemen*, which are said to have inscriptions on them. If those letters bear a strong resemblance to the *Nigari*; and if a story current in *India* be true, that some *Hindu* merchants heard the *Sanscrit* language spoken in *Arabia the Happy*, we might be confirmed in our opinion, that an intercourse formerly subsisted between the two nations of opposite coasts, but should have no reason to believe that they sprang from the same immediate stock. The first syllable of *Himyar*, as many *Europeans* write it, might perhaps induce an etymologist to derive the *Arabs* of *Yemen* from the great ancestor of the *Indians*; but we must observe, that *Himyar* is the proper appellation of those *Arabs*; and many reasons concur to prove, that the word is purely *Arabic*. The similarity of some proper names on the borders of *India* to those of *Arabia*, as the river *Arabius*, a place called *Araba*, a people named *Aribes*

*Aribes* or *Arabies*, and another called *Sabai*, is indeed remarkable, and may hereafter furnish me with observations of some importance, but not at all inconsistent with my present ideas.

II. IT is generally asserted, that the old religion of the *Arabs* was entire *Sabian*; but I can offer so little accurate information concerning the *Sabian* faith, or even the meaning of the word, that I dare not yet speak on the subject with confidence. This at least is certain, that the people of *Yemen* very soon fell into the common, but fatal error of adoring the Sun and the Firmament; for even the *third* in descent from *YOKTAN*, who was consequently as old as *NAHOR*, took the surname of *ABDUSHAMS*, or *Servant of the Sun*; and his family, we are assured, paid particular honours to that luminary. Other tribes worshipped the planets and fixed stars; but the religion of the poets at least seems to have been pure Theism; and this we know with certainty, because we have *Arabian* verses of unsuspected antiquity, which contain pious and elevated sentiments on the goodness and justice, the power and omnipresence of *ALLAH*, or *THE GOD*. If an inscription, said to have been found on marble in *Yemen*, be authentic, the ancient inhabitants of that country preserved the religion of *ESSEB*, and professed a belief in *miracles and a future state*.

WE are also told, that a strong resemblance may be found between the religions of the pagan *Arabs* and the *Hindus*; but, though this may be true, yet an agreement in worshipping the sun and stars will not prove an affinity between the two nations: the *powers* of God represented as *female* deities, the adoration of *stones*, and the name of the idol *WUDD*, may lead us indeed to suspect that some of the *Hindu* superstitions had found their way into *Arabia*; and though we have no traces in *Arabian* History

of

of such a conqueror or legislator as the great SESAC, who is said to have raised pillars in *Yemen* as well as at the mouth of the *Ganges*: yet since we know that SA'CYA is a title of BUDDHA, whom I suppose to be WODEN, since BUDDHA was not a native of *India*, and since the age of SESAC perfectly agrees with that of SA'CYA, we may form a plausible conjecture that they were in fact the same person who travelled eastward from *Ethiopia*, either as a warrior or as a lawgiver, about a thousand years before CHRIST, and whose rites we now see extended as far as the country of *Nifon*, or, as the *Chinese* call it, *Japuen*; both words signifying the *Rising Sun*. SA'CYA may be derived from a word meaning *power*, or from another denoting *vegetable food*; so that this epithet will not determine whether he was a hero or a philosopher; but the title BUDDHA, or *wife*, may induce us to believe that he was rather a benefactor than a destroyer of his species. If his religion however was really introduced into any part of *Arabia*, it could not have been general in that country; and we may safely pronounce, that before the *Mohammedan* revolution, the noble and learned *Arabs* were Theists, but that a stupid idolatry prevailed among the lower orders of the people.

I FIND no trace among them, till their emigration, of any philosophy but *ethics*; and even their system of morals, generous and enlarged as it seems to have been in the minds of a few illustrious chieftains, was, on the whole, miserably depraved for a century at least before MUHAMMED. The distinguishing virtues, which they boasted of inculcating and practising, were a contempt of riches, and even of death; but, in the age of the *Seven Poets*, their liberality had deviated into mad profusion, their courage into ferocity, and their patience into an obstinate spirit of encountering fruitless dangers; but I forbear to expatiate on the manners of the

*Arabs* in that age, because the poems, entitled *Almoðllakát*, which have appeared in our own language, exhibit an exact picture of their virtues and their vices, their wisdom and their folly; and show what may be constantly expected from men of open hearts and boiling passions, with no law to controul, and little religion to restrain them.

III. FEW monuments of antiquity are preserved in *Arabia*, and of those few, the best accounts are very uncertain; but we are assured that inscriptions on rocks and mountains are still seen in various parts of the peninsula; which, if they are in any known language, and if correct copies of them can be procured, may be decyphered by easy and infallible rules.

THE first ALBERT SCHULTENS has preserved in his *Ancient Memorials of Arabia*, the most pleasing of all his works, two little poems in an elegiac strain, which are said to have been found, about the middle of the seventh century, on some fragments of ruined edifices in *Hudramût*, near *Aden*, and are supposed to be of an indefinite, but very remote age. It may naturally be asked,—In what characters were they written? Who decyphered them? Why were not the original letters preserved in the book where the verses are cited? What became of the marbles which *Abdur-rahman*, then Governor of *Yemen*, most probably sent to the *Khalifah* at *Bagdad*? If they be genuine, they prove the people of *Yemen* to have been ‘herdsmen and warriors, inhabiting a fertile and well-watered country, ‘full of game, and near a fine sea abounding with fish, under a monarchical government, and dressed in green silk, or vests of needlework,’ either of their own manufacture, or imported from *India*. The measure of these verses is perfectly regular, and the dialect undistinguishable, at least by me, from that of *Kurajst*; so that, if the *Arabian* writers were much addicted

addicted to literary impostures, I should strongly suspect them to be modern compositions on the instability of human greatness, and the consequences of irreligion, illustrated by the example of the *Himyarick* princes; and the same may be suspected of the first poem quoted by SCHULTENS, which he ascribes to an *Arab* in the age of SOLOMON.

THE supposed houses of the people called *Thamûd* are also still to be seen in excavations of rocks; and, in the time of TABRIZI the Grammarian, a castle was extant in *Yemen*, which bore the name of ALADEAT, an old bard and warrior, who first, we are told, formed his army, thence called *dilk-hamis*, in *five* parts; by which arrangement he defeated the troops of *Himyar* in an expedition against *Sandû*.

OF pillars erected by SESAC, after his invasion of *Yemen*, we find no mention in *Arabian* histories; and, perhaps, the story has no more foundation than another told by the *Greeks* and adopted by NEWTON, that the *Arabs* worshipped URANIA, and even BACCHUS by name, which, they say, means *great* in *Arabic*; but where they found such a word we cannot discover. It is true that *Becca* signifies a *great and tumultuous crowd*, and, in this sense, is one name of the sacred city commonly called *Mecca*.

THE *Câbah*, or *quadrangular* edifice at *Mecca*, is indisputably so ancient, that its original use, and the name of its builder, are lost in a cloud of idle traditions. An *Arab* told me gravely, that it was raised by ABRAHAM, who, as I assured him, was never there: others ascribe it, with more probability, to ISMAIL, or one of his immediate descendants; but whether it was built as a place of divine worship, as a fortress, as a sepulchre, or as a monument of the treaty between the old possessors of *Arabia* and the

sons of KIDAR, antiquaries may dispute, but no mortal can determine. It is thought by RELAND to have been *the mansion of some ancient patriarch, and revered on that account by his posterity*; but the room, in which we now are assembled, would contain the whole *Arabian* edifice; and, if it were large enough for the dwelling-house of a patriarchal family, it would seem ill adapted to the pastoral manners of the *Kedarites*. A *Persian* author insists, that the true name of *Mecca* is *Mahcadah*, or the *Temple of the Moon*; but, although we may smile at his etymology, we cannot but think it probable that the *Cdbah* was originally designed for religious purposes. Three couplets are cited in an *Arabic* History of this building, which, from their extreme simplicity, have less appearance of imposture than other verses of the same kind: they are ascribed to ASAD, a *Tobbi*, or king *by succession*, who is generally allowed to have reigned in *Yemen* an hundred and twenty-eight years before CHRIST's birth; and they commemorate, without any poetical imagery, the magnificence of the prince *in covering the holy temple with striped cloth and fine linen, and in making keys for its gate*. This temple, however, the sanctity of which was restored by MUHAMMED, had been strangely profaned at the time of his birth, when it was usual to decorate its walls with poems on all subjects, and often on the triumphs of *Arabian* gallantry and the praises of *Grecian* wine, which the merchants of *Syria* brought for sale into the deserts.

FROM the want of materials on the subject of *Arabian* antiquity, we find it very difficult to fix the chronology of the *Ismaelites* with accuracy beyond the time of ADNAN, from whom the impostor was descended in the *twenty-first* degree; and, although we have genealogies of ALKAMAH and other *Himyari* bards as high as the *thirtieth* degree, or for a period of

nine

*nine hundred* years at least, yet we can hardly depend on them so far, as to establish a complete chronological system: by reasoning downwards, however, we may ascertain some points of considerable importance. The universal tradition of *Yemen* is, that YOKTAN, the son of EBER, first settled his family in that country; which settlement, by the computation admitted in *Europe*, must have been above *three thousand six hundred* years ago, and nearly at the time when the *Hindus*, under the conduct of RAMA, were subduing the first inhabitants of these regions, and extending the *Indian Empire* from *Ayúdhya*, or *Audh*, as far as the *Isle of Sinhal*, or *Silón*. According to this calculation, NUUMAN, king of *Yemen* in the *ninth* generation from EBER, was cotemporary with JOSEPH; and if a verse composed by that prince, and quoted by ABULFEDA, was really preserved, as it might easily have been, by oral tradition, it proves the great antiquity of the *Arabian* language and metre. This is a literal version of the couplet: ‘When thou, who art in power, conductest affairs with courtesy, thou attainest the high honours of those who are most exalted, and whose mandates are obeyed.’ We are told, that, from an elegant verb in this distich, the royal poet acquired the surname of *Almuṣfer*, or the *Courteous*. Now the reasons for believing this verse genuine are its brevity, which made it easy to be remembered, and the good sense comprised in it, which made it become proverbial; to which we may add, that the dialect is apparently old, and differs in three words from the idiom of *Hebræ*: the reasons for doubting are, that sentences and verses of indefinite antiquity are sometimes ascribed by the *Arabs* to particular persons of eminence; and they even go so far as to cite a pathetic elegy of ADAM himself on the death of ABEL, but in very good *Arabic* and correct measure. Such are the doubts which necessarily must arise on such a subject; yet we have no need of ancient monuments or traditions to prove all that our analysis



analysis requires, namely, that the *Arabs*, both of *Hejâz* and *Yemen*, sprang from a stock entirely different from that of the *Hindus*, and that their first establishments in the respective countries, where we now find them, were nearly coeval.

I CANNOT finish this article without observing, that, when the King of *Denmark's* ministers instructed the *Danish* travellers to collect *historical* books in *Arabic*, but not to busy themselves with procuring *Arabian* poems, they certainly were ignorant that the only monuments of old *Arabian* History are collections of poetical pieces, and the commentaries on them; that all memorable transactions in *Arabia* were recorded in verse; and that more certain facts may be known by reading the *Hamâsah*, the *Diwân* of *Hudhail*, and the valuable work of *Obaidullah*, than by turning over a hundred volumes in prose, unless indeed those poems are cited by the historians as their authorities.

IV. THE manners of the *Hejâzî Arabs*, which have continued, we know, from the time of *SOLOMON* to the present age, were by no means favourable to the cultivation of *arts*; and, as to *sciences*, we have no reason to believe that they were acquainted with any; for the mere amusement of giving names to stars, which were useful to them in their pastoral or predatory rambles through the deserts, and in their observations on the weather, can hardly be considered as a material part of astronomy. The only arts in which they pretended to excellence (I except horsemanship and military accomplishments) were *poetry* and *rhetoric*. That we have none of their compositions in prose before the *Korân*, may be ascribed, perhaps, to the little skill which they seem to have had in writing; to their predilection in favour of poetical measure, and to the facility with which ver-

ses are committed to memory; but all their stories prove, that they were eloquent in a high degree, and possessed wonderful powers of speaking without preparation in flowing and forcible periods. I have never been able to discover what was meant by their books, called *Rawdsim*; but suppose that they were collections of their common, or customary law. Writing was so little practised among them, that their old poems which are now accessible to us, may almost be considered as originally unwritten; and I am inclined to think that SAMUEL JHONSON's reasoning on the extreme imperfection of unwritten languages, was too general; since a language that is only spoken, may nevertheless be highly polished by a people who, like the ancient *Arabs*, make the improvement of their idiom a national concern, appoint solemn assemblies for the purpose of displaying their poetical talents, and hold it a duty to exercise their children in getting by heart their most approved compositions.

THE people of *Yemen* had possibly more *mechanical arts*, and perhaps more *science*; but, although their ports must have been the emporia of considerable commerce between *Egypt* and *India*, or part of *Persia*, yet we have no certain proofs of their proficiency in navigation, or even in manufactures. That the *Arabs* of the desert had musical instruments, and names for the different notes, and that they were greatly delighted with melody, we know from themselves; but their lutes and pipes were probably very simple, and their music, I suspect, was little more than a natural and tuneful recitation of their elegiac verses and love-songs. The singular property of their language, in shunning compound words, may be urged, according to BACON's idea, as a proof that they had made no progress in *arts*; 'which require, says he, a variety of combinations to express the complex notions arising from them;' but the singularity may perhaps be imputed

imputed wholly to the genius of the language, and the taste of those who spoke it; since the old *Germans* who knew no art, appear to have delighted in compound words, which poetry and oratory, one would conceive, might require as much as any meaner art whatsoever.

So great, on the whole, was the strength of parts or capacity, either natural or acquired from habit, for which the *Arabs* were ever distinguished, that we cannot be surprized when we see that blaze of genius which they displayed, as far as their arms extended, when they burst, like their own dyke of *Arin*, through their ancient limits, and spread, like an inundation, over the great empire of *Iràn*. That a race of *Tázis*, or *Coursers*, as the *Persians* call them, ‘ who drank the milk of camels and fed on lizards, should entertain a thought of subduing the kingdom of *FERIDUN*’, was considered by the General of *YEZDEGIRD*’s army as the strongest instance of fortune’s levity and mutability; but *FIRDAUSI*, a complete master of *Asiatic* manners, and singularly impartial, represents the *Arabs*, even in the age of *FERIDUN*, as ‘ disclaiming any kind of dependence on that monarch, exulting in their liberty, delighting in eloquence, acts of liberality, and martial achievements, and thus making the whole earth, says the poet, red as wine with the blood of their foes, and the air like a forest of canes with their tall spears.’ With such a character they were likely to conquer any country that they could invade; and, if *ALEXANDER* had invaded their dominions, they would unquestionably have made an obstinate, and probably a successful, resistance.

BUT I have detained you too long, gentlemen, with a nation who have ever been my favourites; and hope at our next anniversary meeting to travel with you over a part of *Asia*, which exhibits a race of men distinct both  
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from the *Hindus*, and from the *Arabs*. In the mean time, it shall be my care to superintend the publication of your Transactions; in which, if the learned in *Europe* have not raised their expectations too high, they will not, I believe, be disappointed: my own imperfect essays I always except; but though my other engagements have prevented my attendance on your Society for the greatest part of last year, and I have set an example of that freedom from restraint, without which no society can flourish, yet, as my few hours of leisure will now be devoted to *Sanscrit* literature, I cannot but hope, though my chief object be a knowledge of *Hindu Law*, to make some discovery in other sciences, which I shall impart with humility, and which you will, I doubt not, receive with indulgence.



## II.

### THE FIFTH ANNIVERSARY DISCOURSE,

DELIVERED 21 FEBRUARY, 1788.

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BY THE PRESIDENT.

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AT the close of my last address to you, Gentlemen, I declared my design of introducing to your notice a people of *Asia*, who seemed as different in most respects from the *Hindus* and *Arabs* as those two nations had been shown to differ from each other; I meant the people whom we call *Tartars*: but I enter with extreme diffidence on my present subject, because I have little knowledge of the *Tartarian* dialects; and the gross errors of *European* writers on *Asiatic* literature have long convinced me that no satisfactory account can be given of any nation with whose language we are not perfectly acquainted. Such evidence, however, as I have procured by attentive reading and scrupulous inquiries, I will now lay before you, interspersing such remarks as I could not but make on that evidence, and submitting the whole to your impartial decision.

CONFORMABLY to the method before adopted in describing *Arabia* and *India*, I consider *Tartary* also, for the purpose of this discourse, on its most extensive scale, and request your attention whilst I trace the largest boundaries that are assignable to it. Conceive a line drawn from the *Mouth*

of the *Oby* to that of the *Dnieper*, and, bringing it back eastward across the *Euxine*, so as to include the peninsula of *Krim*, extend it along the foot of *Caucasus*, by the rivers *Cur* and *Aras*, to the *Caspian Lake*, from the opposite shore of which follow the course of the *Jaihun* and the chain of *Caucasian* hills as far as those of *Imaus*; whence continue the line beyond the *Chinese Wall* to the *White Mountain*, and the country of *Yetsu*; skirting the borders of *Persia*, *India*, *China*, *Corea*, but including part of *Russia*, with all the districts which lie between the *Glacial Sea* and that of *Japan*. M. DE GUIGNES, whose great work on the *Huns* abounds more in solid learning than in rhetorical ornaments, presents us, however, with a magnificent image of this wide region; describing it as a stupendous edifice, the beams and pillars of which are many ranges of lofty hills, and the dome one prodigious mountain, to which the *Chinese* give the epithet of *Celestial*, with a considerable number of broad rivers flowing down its sides. If the mansion be so amazingly sublime, the land around it is proportionably extended, but more wonderfully diversified; for some parts of it are incruited with ice, others parched with inflamed air, and covered with a kind of lava: here we meet with immense tracks of sandy deserts and forests, almost impenetrable; there, with gardens, groves, and meadows, perfumed with musk, watered by numberless rivulets, and abounding in fruits and flowers; and from east to west lie many considerable provinces, which appear as valleys in comparison of the hills towering above them; but in truth are the flat summits of the highest mountains in the world, or at least the highest in *Asia*. Near one-fourth in latitude of this extraordinary region is in the same charming climate with *Greece*, *Italy*, and *Provence*; and another fourth in that of *England*, *Germany*, and the northern parts of *France*; but the *Hyperborean* countries can have few beauties to recommend them, at least in the present state of the earth's temperature. To  
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the south, on the frontiers of *Iràn* are the beautiful vales of *Soghî*, with the celebrated cities of *Samarkand* and *Bokhârâ*; on those of *Tibet* are the territories of *Cashghar*, *Khoten*, *Chegil*, and *Khatâ*, all famed for perfumes and for the beauty of their inhabitants; and on those of *China* lies the country of *Chin*, anciently a powerful kingdom; which name, like that of *Khatâ*, has in modern times been given to the whole *Chinese* empire, where such an appellation would be thought an insult. We must not omit the fine territory of *Tancût*, which was known to the *Greeks* by the name of *Serica*, and considered by them as the farthest eastern extremity of the habitable globe.

SCYTHIA seems to be the general name which the ancient *Europeans* gave to as much as they knew of the country thus bounded and described; but whether that word be derived, as *PLINY* seems to intimate, from *Sacai*, a people known by a similar name to the *Greeks* and *Persians*, or, as *BRYANT* imagines, from *Cutina*, or, as Colonel *VALLANCEY* believes, from words denoting *navigation*, or, as it might have been supposed, from a *Greek* root implying *wrath* and ferocity, this at least is certain, that, as *India*, *China*, *Persia*, *Japan*, are not appellations of those countries in the languages of the nations who inhabit them, so neither *Scythia* nor *Tartary* are names by which the inhabitants of the country, now under our consideration have ever distinguished themselves. *Tatârystân* is, indeed, a word used by the *Persians* for the south-western part of *Scythia*, where the musk-deer is said to be common; and the name *Tártar* is by some considered as that of a particular tribe; by others, as that of a small river only; while *Tôrân*, as opposed to *Irân*, seems to mean the ancient dominion of *AFRA'SIA'* to the north and east of the *Oxus*. There is nothing more idle than a debate concerning

name ,



names, which, after all, are of little consequence when our ideas are distinct without them. Having given, therefore, a correct notion of the country which I proposed to examine, I shall not scruple to call it by the general name of *Tartary*; though I am conscious of using a term equally improper in the pronunciation and the application of it.

TARTARY then, which contained, according to PLINY, *an innumerable multitude of nations*, by whom the rest of *Asia* and all *Europe* has in different ages been over-run, is denominated, as various images have presented themselves to various fancies, the *great hive of the northern swarms*, the *nursery of irresistible legions*, and, by a stronger metaphor, the *foundery of the human race*: but M. BAILLY, a wonderfully ingenious man, and a very lively writer, seems first to have considered it as the *cradle of our species*, and to have supported an opinion, that the whole ancient world was enlightened by sciences brought from the most northern parts of *Scythia*, particularly from the *Banks of the Jenisea*, or from the *Hyperborean* regions. All the fables of old *Greece*, *Italy*, *Persia*, *India*, he derives from the north; and it must be owned that he maintains his paradox with acuteness and learning. Great learning and great acuteness, together with the charms of a most engaging style, were indeed necessary to render even tolerable a system which places an earthly paradise, the gardens of *Hesperus*, the islands of the *Macares*, the groves of *Elysium*, if not of *Eden*, the heaven of *INDRA*, the *Perisûn*, or fairy-land, of the *Persian* poets, with its city of diamonds and its country of *Shûdcâm*, so named from *Pleasure* and *Love*, not in any climate which the common sense of mankind considers as the seat of delights, but beyond the *Mouth of the Oby*, in the *Frozen Sea*, in a region equalled only by that where the wild imagination of DANTE led him to fix the worst of criminals in a state

state of punishment after death, and of which *he could not*, he says, *even think without shivering*. A very curious passage, in a tract of PLUTARCH, on *the figure in the Moon's orb*, naturally induced M. BAILLY to place *Ogygia* in the north; and he concludes that island, as others have concluded rather fallaciously, to be the *Atlantis* of PLATO; but is at a loss to determine whether it was *Iceland* or *Greenland*, *Spitzbergen* or *New Zembla*. Among so many charms, it was difficult indeed to give a preference; but our philosopher, though as much perplexed by an option of beauties as the shepherd of *Ida*, seems on the whole to think *Zembla* the most worthy of the *golden fruit*; because it is indisputably an island, and lies opposite to a gulph near a continent, from which a great number of rivers descend into the ocean. He appears equally distressed among five nations, real and imaginary, to fix upon that which the *Greeks* named *Atlantes*; and his conclusion in both cases must remind us of the showman at *Eton*, who, having pointed out in his box all the crowned heads of the world, and being asked by the school-boys, who looked through the glass, which was the Emperor, which the Pope, which the Sultan, and which the Great Mogul, answered eagerly, ‘which you please, young gentlemen, which you please.’ His letters however to VOLTAIRE, in which he unfolds his new system to his friend, whom he had not been able to convince, are by no means to be derided; and his general proposition, that arts and sciences had their source in *Tartary*, deserves a longer examination than can be given to it in this discourse.—I shall, nevertheless, with your permission, shortly discuss the question, under the several heads that will present themselves in order.

ALTHOUGH we may naturally suppose that the numberless communities of *Tartars*, some of whom are established in great cities, and some  
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encamped on plains in ambulatory mansions, which they remove from pasture to pasture, must be as different in their features as in their dialects; yet, among those who have not emigrated into another country and mixed with another nation, we may discern a family-likeness, especially in their eyes and countenance, and in that configuration of lineaments which we generally call a *Tartar-face*; but, without making anxious inquiries, whether all the inhabitants of the vast region before described have similar features, we may conclude from those whom we have seen, and from the original portraits of TAIMU'R and his descendants, that the *Tartars* in general differ wholly in complexion and countenance from the *Hindus* and from the *Arabs*: an observation which tends in some degree to confirm the account given by modern *Tartars* themselves of their descent from a common ancestor. Unhappily, their lineage cannot be proved by authentic pedigrees or historical monuments; for all their writings extant, even those in the *Mogul* dialect, are long subsequent to the time of MUHAMMED; nor is it possible to distinguish their genuine traditions from those of the *Arabs*, whose religious opinions they have in general adopted. At the beginning of the *fourteenth* century, *Khwdjah* RASHI'D, surnamed FAD'LU'LLAH, a native of *Kazvin*, compiled his account of the *Tartars* and *Mongals* from the papers of one PU'LA'D, whom the great grandson of HOLACU' had sent into *Tátáristán*, for the sole purpose of collecting historical information; and the commission itself shows how little the *Tartarian* Princes really knew of their own origin. From this work of RASHI'D, and from other materials, ABU'LGHA'ZI', King of *Khvárezm*, composed in the *Mogul* language his *Genealogical History*, which, having been purchased from a merchant of *Bokháru* by some *Swedish* officers, prisoners of war in *Siberia*, has found its way into several *European* tongues. It contains  
much

much valuable matter, but, like all MUHAMMEDAN histories, exhibits tribes or nations as individual sovereigns; and if Baron DE TORR had not strangely neglected to procure a copy of the *Tartarian* History, for the original of which he unnecessarily offered a large sum, we should probably have found that it begins with an account of the deluge, taken from the *Korán*, and proceeds to rank TURC, CHI'N, TATA'R, and MONGAL, among the sons of YA'FET. The genuine traditional history of the *Tartars*, in all the books that I have inspected, seems to begin with OGHU'Z, as that of the *Hindus* does with RA'MA: they place their miraculous Hero and Patriarch *four thousand* years before CHENGIZ KHA'N, who was born in the year 1164, and with whose reign their historical period commences. It is rather surprizing that M. BAILLY, who makes frequent appeals to etymological arguments, has not derived OGYGES from OGHU'Z, and ATLAS from *Altai*, or the *Golden Mountain* of *Tartary*: the *Greek* terminations might have been rejected from both words; and a mere transposition of letters is no difficulty with an etymologist.

My remarks in this address, Gentlemen, will be confined to the period preceding CHENGIZ; and, although the learned labours of M. DE GUIGNES, and the fathers VISDELOU, DEMAILLA, and GAUBIL, who have made an incomparable use of their *Chinefe* literature, exhibit probable accounts of the *Tartars* from a very early age, yet the old historians of *China* were not only foreign, but generally hostile to them; and for both those reasons, either through ignorance or malignity, may be suspected of misrepresenting their transactions. If they speak truth, the ancient history of the *Tartars* presents us, like most other histories, with a series of assassinations, plots, treasons, massacres, and all the natural fruits of selfish ambition. I should have no inclination to give you a sketch of such horrors,

even if the occasion called for it; and will barely observe that the first king of the *Hunnums*, or *Huns*, began his reign, according to VISDELOU, about *three thousand five hundred and sixty years ago*, not long after the time fixed in my former discourses for the first regular establishments of the *Hindus* and *Arabs* in their several countries.

I. OUR first inquiry concerning the *languages* and *letters* of the *Tartars*, presents us with a deplorable void, or with a prospect as barren and dreary as that of their deserts. The *Tartars*, in general, had no literature (in this point all authorities appear to concur); the *Turcs* had no letters; the *Huns*, according to PROCOPIUS, had not even heard of them; the magnificent CHENGIZ, whose empire included an area of near eighty square degrees, could find none of his own *Mongals*, as the best authors inform us, able to write his dispatches; and TAIMUR, a savage of strong natural parts and passionately fond of hearing histories read to him, could himself neither write nor read. It is true that IBNU ARAB. SHAH mentions a set of characters called *Dilberjin*, which were used in *Khâtâ*: “he had seen them,” he says, “and found them to consist of forty-one letters, a distinct symbol being appropriated to each long and short vowel, and to each consonant hard or soft, or otherwise varied in pronunciation;” but *Khâtâ* was in *Southern Tartary*, on the confines of *India*; and, from his description of the characters there in use, we cannot but suspect them to have been those of *Thibet*, which are manifestly *Indian*, bearing a greater resemblance to those of *Bengal* than to *Dévanâgarî*. The learned and eloquent *Arab* adds, “that the *Tatars* of *Khâtâ* write, in the *Dilberjin* letters, all their tales and histories, their journals, poems, and miscellanies, their diplomas, records of state and justice, the laws of CHENGIZ, their public registers, and their compositions of every species.”

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If this be true, the people of *Khâtâ* must have been a polished and even a lettered nation; and it may be true, without affecting the *generat* position, that the *Tartars* were illiterate; but IBNU ARABSHAH was a professed rhetorician, and it is impossible to read the original passage without full conviction that his object in writing it was to display his power of words in a flowing and modulated period. He says further, that in *Jaghatâi* the people of *Oighûr*, as he calls them, “have a system of *fourteen* “ letters only, denominated from themselves *Oighûrî*,” and those are the characters which the *Mongals* are supposed by most authors to have borrowed. ABU’LGHAZI’ tells us only, that CHENGIZ employed the natives of *Eighûr* as excellent penmen; but the *Chinese* assert, that he was forced to employ them, because he had no writers at all among his natural-born subjects; and we are assured by many, that KUBLAIKHA’N ordered letter to be invented for his nation by a *Thibetian*, whom he rewarded with the dignity of Chief *Lama*. The small number of *Eighûrî* letters might induce us to believe that they were *Zend* or *Pahlavi*, which must have been current in that country when it was governed by the sons of FERIDUN; and if the alphabet ascribed to the *Eighurians* by M. DES HAUTESRAYES be correct, we may safely decide, that in many of its letters it resembles both the *Zend* and the *Syriac*, with a remarkable difference in the mode of connecting them; but as we can scarce hope to see a genuine specimen of them, our doubt must remain in regard to their form and origin. The page exhibited by HYDE as *Khatayan* writing, is evidently a sort of broken *Cufick*; and the fine manuscript at *Oxford*, from which it was taken, is more probably a *Mendeian* work on some religious subject than, as he imagined, a code of *Tartarian* laws. That very learned man appears to have made a worse mistake in giving us for *Mongal* characters, a page of writing which has the appearance of *Japanese*, or mutilated *Chinese* letters.

IF the *Tartars* in general, as we have every reason to believe, had no written memorials, it cannot be thought wonderful that their *languages*, like those of *America*, should have been in perpetual fluctuation, and that more than fifty dialects, as HYDE had been credibly informed, should be spoken between *Moscow* and *China* by the many kindred tribes, or their several branches, which are enumerated by ABU'LGHA'ZI'. What those dialects are, and whether they really sprang from a common stock, we shall probably learn from Mr. PALLAS, and other indefatigable men employed by the *Russian* court; and it is from the *Russians* that we must expect the most accurate information concerning their *Asiatic* subjects. I persuade myself that, if their inquiries be judiciously made and faithfully reported, the result of them will prove that all the languages properly *Tartarian* arose from one common source, excepting always the jargons of such wanderers or mountaineers as, having long been divided from the main body of the nation, must in a course of ages have framed separate idioms for themselves. The only *Tartarian* language of which I have any knowledge, is the *Turkish* of *Constantinople*, which is however so copious, that whoever shall know it perfectly, will easily understand, as we are assured by intelligent authors, the dialects of *Tütürisàn*; and we may collect from ABU'LGHA'ZI', that he would find little difficulty in the *Calmac* and the *Mogul*. I will not offend your ears by a dry catalogue of similar words in those different languages; but a careful investigation has convinced me, that, as the *Indian* and *Arabian* tongues are severally descended from a common parent, so those of *Tartary* might be traced to one ancient stem essentially differing from the two others. It appears, indeed, from a story told by ABU'LGHA'ZI', that the *Viràts* and the *Mongals* could not understand each other; but no more can the *Danes* and the *English*, yet their dialects beyond a doubt are branches of the

he same *Gothic* tree. The dialect of the *Moguls*, in which some histories of TAIMU'R and his descendants were originally composed, is called in *India*, where a learned native set me right when I used another word, *Turci*; not that it is precisely the same with the *Turkish* of the *Othmán-lus*, but the two idioms differ, perhaps, less than *Swedish* and *German*, or *Spanish* and *Portuguese*, and certainly less than *Welsh* and *Irish*. In hope of ascertaining this point, I have long searched in vain for the original works ascribed to TAIMU'R and BA'BER; but all the *Moguls* with whom I have conversed in this country, resemble the crow in one of their popular fables, who, having long affected to walk like a pheasant, was unable after all to acquire the gracefulness of that elegant bird, and in the mean time unlearned his own natural gait: they have not learned the dialect of *Persia*, but have wholly forgotten that of their ancestors. A very considerable part of the old *Tartarian* language, which in *Asia* would probably have been lost, is happily preserved in *Europe*; and if the ground-work of the western *Turkish*, when separated from the *Persian* and *Arabic*, with which it is embellished, be a branch of the lost *Oghizian* tongue, I can assert with confidence, that it has not the least resemblance either to *Arabic* or *Sanscrit*, and must have been invented by a race of men wholly distinct from the *Arabs* or *Hindus*. This fact alone oversets the system of M. BAILLY, who considers the *Sanscrit*, of which he gives in several places a most erroneous account, as 'a fine monument of his primeval Scythians, the preceptors of mankind, and planters of a sublime philosophy, even in India;' for he holds it an incontestable truth, that a language which is dead, supposes a nation which is destroyed; and he seems to think such reasoning perfectly decisive of the question, without having recourse to astronomical arguments, or the spirit of ancient institutions. For my part, I desire no better proof than that which the language of

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the *Bráhmans* affords, of an immemorial and total difference between the *Savages of the Mountains*, as the old *Chinese* justly called the *Tartars*, and the studious, placid, contemplative inhabitants of these *Indian* plains.

II. THE *geographical* reasoning of M. BAILLY, may, perhaps, be thought equally shallow, if not inconsistent in some degree with itself. ‘An adoration of the sun and of fire,’ says he, ‘must necessarily have arisen in a cold region; therefore, it must have been foreign to *India*, *Persia*, *Arabia*; therefore, it must have been derived from *Tartary*.’ No man, I believe, who has travelled in winter through *Bahár*, or has even passed a ‘cold season at *Calcutta* within the tropic, can doubt that the solar warmth is often desirable by all, and might have been considered as adorable by the ignorant in these climates, or that the return of spring deserves all the salutations which it receives from the *Persian* and *Indian* poets; not to rely on certain historical evidence, that ANTA-RAH, a celebrated warrior and bard, actually perished with cold on a mountain of *Arabia*. To meet, however, an objection, which might naturally be made to the voluntary settlement and amazing population of his primitive race in the icy regions of the north, he takes refuge in the hypothesis of M. BUFFON, who imagines that our whole globe was at first of a white heat, and has been gradually cooling from the poles to the equator; so that the *Hyperborean* countries had once a delightful temperature, and *Siberia* itself was even *hotter than the climate of our temperate zones*, that is, was in too hot a climate, by his first proposition, for the primary worship of the sun. That the temperature of countries has not sustained a change in the lapse of ages, I will by no means insist; but we can hardly reason conclusively, from a variation of temperature, to the cultivation and diffusion of science. If as many female elephants and tigresses as we now find in  
Bengal,

*Bengal*, had formerly littered in the *Siberian* forests, and the young, as the earth cooled, had sought a genial warmth in the climate of the south, it would not follow that other savages, who migrated in the same direction and on the same account, brought religion and philosophy, language and writing, art and science, into the southern latitudes. .

WE are told by ABU'LGHA'ZI', that the primitive religion of human creatures, or the pure adoration of One Creator, prevailed in *Tartary* during the first generations from YA'FET, but was extinct before the birth of OGHU'Z, who restored it in his dominions; that, some ages after him, the *Mongals* and the *Turcs* relapsed into gross idolatry, but that CHENGIZ was a Theist, and, in a conversation with the *Muhammedan* Doctors, admitted their arguments for the being and attributes of the Deity to be unanswerable, while he contested the evidence of their Prophet's legation. From old *Grecian* authorities we learn, that the *Maffagete* worshipped the sun; and the narrative of an embassy from JUSTIN to the *Khakàn*, or Emperor, who then resided in a fine vale near the source of the *Irtish*, mentions the *Tartarian* ceremony of purifying the *Roman* Ambassadors by conducting them between two fires. The *Tartars* of that age are represented as adorers of the *four elements*, and believers in an invisible spirit, to whom they sacrificed bulls and rams. Modern travellers relate that, in the festivals of some *Tartarian* tribes, they pour a few drops of a consecrated liquor on the statues of their Gods; after which an attendant sprinkles a little of what remains three times toward the south in honour of fire, toward the west and east in honour of water and air, and as often toward the north in honour of the earth, which contained the reliques of their deceased ancestors. Now all this may be very true, without proving a national affinity

affinity between the *Tartars* and *Hindus* ; for the *Arabs* adored the planets and the works of nature ; the *Arabs* had carved images, and made libations on a black stone ; the *Arabs* turned in prayer to different quarters of the heavens ; yet we know with certainty, that the *Arabs* are a distinct race from the *Tartars* ; and we might as well infer that they were the same people, because they had each their *Nomades, or wanderers for pasture*, and because the *Turcmans*, described by IBNUARABSH'AH, and by him called *Tútárs*, are, like most *Arabian* tribes, pastoral and warlike, hospitable and generous, wintering and summering on different plains, and rich in herds and flocks, horses and camels ; but this agreement in manners proceeds from the similar nature of their several deserts, and their similar choice of a free rambling life, without evincing a community of origin, which they could scarce have had without preserving some remnant at least of a common language.

MANY *Lamas*, we are assured, or Priests of BUDDHA, have been found settled in *Siberia* ; but it can hardly be doubted that the *Lamas* had travelled thither from *Thibet*, whence it is more than probable that the religion of the *Buddhas* was imported into *Southern, or Chinese Tartary*, since we know that rolls of *Thibetian* writing have been brought even from the borders of the *Caspian*. The complexion of BUDDHA himself, which, according to the *Hindus*, was *between white and ruddy*, would perhaps have convinced M. BAILLY, had he known the *Indian* tradition, that the last great legislator and God of the East was a *Tartar* ; but the *Chinese* consider him as a native of *India* ; the *Bráhmans* insist, that he was born in a forest near *Gayá* ; and many reasons may lead us to suspect that his religion was carried from the west and the south to those eastern and northern countries in which it prevails. On the whole, we meet  
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with few or no traces in *Scythia* of *Indian* rites and superstitions, or of that poetical mythology with which the *Sanscrit* poems are decorated; and we may allow the *Tartars* to have adored the Sun with more reason than any southern people, without admitting them to have been the sole original inventors of that universal folly. We may even doubt the originality of their veneration for the *four elements*, which forms a principal part of the ritual introduced by ZER'ATUSHT, a native of *Rai* in *Persia*, born in the reign of GUSHTASP; whose son, PASH'UTEN, is believed by the *Parsis* to have resided long in *Tartary*, at a place called *Cangidix*; where a magnificent palace is said to have been built by the father of CYRUS, and where the *Persian* prince, who was a zealot in the new faith, would naturally have disseminated its tenets among the neighbouring *Tartars*.

OF any philosophy, except natural ethics, which the rudest society requires and experience teaches, we find no more vestiges in *Asiatic Scythia* than in ancient *Arabia*: nor would the name of a philosopher and a *Scythian* have been ever connected, if ANACHARSIS had not visited *Athens* and *Lydia* for that instruction which his birth-place could not have afforded him: but ANACHARSIS was the son of a *Grecian* woman, who had taught him her language; and he soon learned to despise his own. He was unquestionably a man of a sound understanding and fine parts; and, among the lively sayings which gained him the reputation of a wit, even in *Greece*, it is related by DIOGENES LAERTIUS, that, when an *Athenian* reproached him with being a *Scythian*, he answered, 'My country is, indeed, a disgrace to me, but thou art a disgrace to thy country.' What his country was, in regard to manners and civil duties, we may learn from his fate in it; for when, on his return from *Athens*,

he attempted to reform it, by introducing the wife laws of his friend SOLON, he was killed on a hunting party, with an arrow shot by his own brother, a *Scythian* chieftain. Such was the philosophy of M. BAILLY's *Atlantes*, the first and most enlightened of nations! We are assured, however, by the learned author of the *Dubiflan*, that the *Tartars* under CHENGIZ, and his descendants, were lovers of truth; and would not even preserve their lives by a violation of it. DE GUIGNES ascribes the same veracity, the parent of all virtues, to the *Iluns*; and STRABO, who might only mean to lash the *Greeks* by praising Barbarians, as HORACE extolled the wandering *Scythians* merely to satirize his luxurious countrymen, informs us, that the nations of *Scythia* deserved the praise due to wisdom, heroic friendship, and justice; and this praise we may readily allow them on his authority, without supposing them to have been the preceptors of mankind.

As to the laws of ZAMOLXIS, concerning whom we know as little as of the *Scythian* DEUCALION, or of ABARIS the *Hyperborean*, and to whose story even HERODOTUS gave no credit, I lament, for many reasons, that, if ever they existed, they have not been preserved. It is certain, that a system of laws, called *Ydsac*, has been celebrated in *Tartary* since the time of CHENGIZ, who is said to have republished them in his empire, as his institutions were afterwards adopted and enforced by TAIMU'R; but they seem to have been a common, or traditionary law, and were probably not reduced into writing till CHENGIZ had conquered a nation who were able to write.

III. HAD the religious opinions and allegorical fables of the *Hindus* been actually borrowed from *Scythia*, travellers must have discovered in  
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that country some ancient monuments of them; such as pieces of grotesque sculpture, images of the Gods and *Avatars*, and inscriptions on pillars, or in caverns, analogous to those which remain in every part of the western peninsula, or to those which many of us have seen in *Bahar*, and at *Banâras*; but (except a few detached idols) the only great monuments of *Tartarian* antiquity are a line of ramparts on the west and east of the *Caspian*; ascribed, indeed, by ignorant *Muselmans* to *Yâdj* and *Mâdj*, or *Gog* and *Magog*, that is to the *Scythians*; but manifestly raised by a very different nation, in order to stop their predatory inroads through the passes of *Caucasus*. The *Chinese* wall was built or finished on a similar construction, and for a similar purpose, by an Emperor who died only two hundred and ten years before the beginning of our era; and the other mounds were very probably constructed by the old *Persians*, though, like many works of unknown origin, they are given to *SECANDER*; not the *Macedonian*, but a more ancient hero, supposed by some to have been *JEMSHI'D*. It is related that pyramids and tombs have been found in *Tâtâristân*, or *Western Scythia*, and some remnants of edifices in the lake *Saïsan*; that vestiges of a deserted city have been recently discovered by the *Russians* near the *Caspian Sea*, and the *Mountain of Eagles*; and that golden ornaments and utensils, figures of elks and other quadrupeds in metal, weapons of various kinds, and even implements for mining, but made of copper, instead of iron, have been dug up in the country of the *Tshûdès*; whence M. BAILLY infers, with great reason, the high antiquity of that people. But the high antiquity of the *Tartars*, and their establishment in that country near four thousand years ago, no man disputes; we are enquiring into their ancient religion and philosophy, which neither ornaments of gold nor tools of copper will prove to have had an affinity with the religious rites and the sciences of *India*. The

golden utensils might possibly have been fabricated by the *Tartars* themselves; but it is possible too that they were carried from *Rome*, or from *China*, whence occasional embassies were sent to the Kings of *Eighûr*. Towards the end of the tenth century the *Chinese* Emperor dispatched an ambassador to a Prince named ERSLA'N, which in the *Turkish* of *Constantinople* signifies a *lion*, who resided near the *Golden Mountain* in the same station, perhaps, where the *Romans* had been received in the middle of the sixth century. The *Chinese* on his return home reported the *Eighûrs* to be a grave people, with fair complexions, diligent workmen, and ingenious artificers not only in gold, silver, and iron, but in jasper and fine stones; and the *Romans* had before described their magnificent reception in a rich palace, adorned with *Chinese* manufactures. But these times were comparatively modern; and, even if we should admit that the *Eighûrs*, who are said to have been governed for a period of two thousand years by an *Idcut*, or sovereign of their own race, were in some very early age a literary and polished nation, it would prove nothing in favour of the *Huns*, *Turcs*, *Mongals*, and other savages to the north of *Pekin*, who seem in all ages before MUHAMMED, to have been equally ferocious and illiterate.

WITHOUT actual inspection of the manuscripts that have been found near the *Caspian*, it would be impossible to give a correct opinion concerning them; but one of them, described as written on blue silky paper, in letters of gold and silver, not unlike *Hebrew*, was probably a *Thibetian* composition, of the same kind with that which lay near the source of the *Irtish*, and of which CASSIANO, I believe, made the first accurate version. Another, if we may judge from the description of it, was probably modern *Turkish*; and none of them could have been of great antiquity.

IV. FROM ancient monuments, therefore, we have no proof that the *Tartars* were themselves well-instructed, much less that they instructed the world; nor have we any stronger reason to conclude from their general manners and character, that they had made an early proficiency in *arts and sciences*. Even of poetry, the most universal and most natural of the fine arts, we find no genuine specimens ascribed to them, except some horrible war-songs, expressed in *Persian* by ALI' of *Yezd*, and possibly invented by him. After the conquest of *Persia* by the *Mongals*, their princes, indeed, encouraged learning, and even made astronomical observations at *Samarkand*. As the *Turcs* became polished by mixing with the *Persians* and *Arabs*, though *their very nature*, as one of their own writers confesses, *had before been like an incurable dyspepsy, and their minds clouded with ignorance*; thus also the *Manchu* monarchs of *China* have been patrons of the learned and ingenious; and the Emperor TIEN-LONG is, if he be now living, a fine *Chinese* poet. In all these instances the *Tartars* have resembled the *Romans*, who, before they had subdued *Greece*, were little better than tigers in war, and *Fauns* or *Sylvans* in science and art.

BEFORE I left *Europe* I had insisted in conversation, that the *Tuzuk*, translated by Major DAVY, was never written by TAÏMU'R himself, at least not as CÆSAR wrote his Commentaries, for one very plain reason, that no *Tartarian* king of his age could write at all; and, in support of my opinion, I had cited IËNU ARABSHA'H, who, though justly hostile to the savage by whom his native city, *Damascus*, had been ruined, yet praises his talents, and the real greatness of his mind, but adds, — “ He was wholly illiterate; he neither read nor wrote any thing; and he knew nothing of *Arabic*; though of *Persian*,

“ *T. 1. 1. 1.*



“ *Turkish*, and the *Mogul* dialect, he knew as much as was sufficient for his purpose, and no more. He used with pleasure to hear histories read to him; and so frequently heard the same book, that he was able by memory to correct an inaccurate reader.” This passage had no effect on the translator, whom *great and learned men in India had assured*, it seems, *that the work was authentic*; by which he meant, *composed by the conqueror himself*: but the *great* in this country might have been *unlearned*, or the *learned* might not have been *great* enough to answer any leading question in a manner that opposed the declared inclination of a *British* inquirer; and, in either case, since no witnesses are named, so general a reference to them will hardly be thought conclusive evidence. On my part, I will name a *Muselman*, whom we all know, and who has enough both of *greatness* and of *learning* to decide the question both impartially and satisfactorily: the *Nawwâb* MOZAFFER JANG informed me of his own accord, that no man of sense in *Hindustân* believed the work to have been composed by TAIMU’R; but that his favourite, surnamed HINDU SHA’H, was known to have written that book, and others ascribed to his patron, after many confidential discourses with the *Emir*, and, perhaps, nearly in the Prince’s words as well as in his person: a story which ALI’ of *Yezd*, who attended the court of TAIMU’R, and has given us a flowery panegyric instead of a history, renders highly probable, by confirming the latter part of the *Arabian* account, and by total silence as to the literary productions of his master. It is true, that a very ingenious but indigent native, whom DAVY supported, has given me a written memorial on the subject, in which he mentions TAIMU’R as the author of two works in *Turkish*; but the credit of his information is overset by a strange apocryphal story of a king of *Yemen*, who invaded, he says, the *Emir’s* dominions, and in whose library the manuscript was after

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wards found, and translated by order of ALI'SHI'R, first minister of TAIMU'R's grandson; and Major DAVY himself, before he departed from *Bengal*, told me, that he was greatly perplexed by finding in a very accurate and old copy of the *Tuzuc*, which he designed to republish with considerable additions, a particular account, written *unquestionably* by TAIMU'R, of *his own death*. No evidence, therefore, has been adduced to shake my opinion, that the *Moguls* and *Tartars*, before their conquest of *India* and *Persia*, were wholly unlettered; although it may be possible that even without art or science, they had, like the *Huns*, both warriors and lawgivers in their own country some centuries before the birth of CHRIST.

IF learning was ever anciently cultivated in the regions to the north of *India*, the seats of it, I have reason to suspect, must have been *Eighür*, *Cashghar*, *Khata*, *Chin*, *Tancüt*, and other countries of *Chinese Tartary*, which lie between the thirty-fifth and forty-fifth degrees of northern latitude; but I shall, in another discourse, produce my reasons for supposing that those very countries were peopled by a race allied to the *Hindus*, or enlightened at least by their vicinity to *India* and *China*; yet in *Tancüt*, which by some is annexed to *Thibet*, and even among its old inhabitants, the *Sercs*, we have no certain accounts of uncommon talents or great improvements: they were famed, indeed, for the faithful discharge of moral duties, for a pacific disposition, and for that longevity which is often the reward of patient virtues and a calm temper; but they are said to have been wholly indifferent in former ages to the elegant arts, and even to commerce; though FADLU'LLAH had been informed that, near the close of the *thirteenth* century, many branches of natural philosophy were cultivated in *Cam-chou*, then the metropolis of *Serica*.

WE may readily believe those who assure us, that some tribes of wandering *Tartars* had real skill in applying herbs and minerals to the purposes of medicine, and pretended to skill in magic; but the general character of their nation seems to have been this: They were professed hunters or fishers, dwelling on that account in forests or near great rivers, under huts or rude tents, or in waggons drawn by their cattle from station to station; they were dexterous archers, excellent horsemen, bold combatants, appearing often to flee in disorder for the sake of renewing their attack with advantage; drinking the milk of mares, and eating the flesh of colts; and thus in many respects resembling the old *Arabs*; but in nothing more than in their love of intoxicating liquors, and in nothing less than in a taste for poetry and the improvement of their language.

THUS has been proved, and, in my humble opinion, beyond controversy, that the far greater part of *Asia* has been peopled and immemorably possessed by three considerable nations, whom, for want of better names, we may call *Hindus*, *Arabs*, and *Tartars*; each of them divided and subdivided into an infinite number of branches, and all of them so different in form and features, language, manners, and religion, that if they sprang originally from a common root, they must have been separated for ages. Whether more than three primitive stocks can be found, or, in other words, whether the *Chinese*, *Japanese*, and *Persians*, are entirely distinct from them, or formed by their intermixture, I shall hereafter, if your indulgence to me continue, diligently inquire. To what conclusions these inquiries will lead, I cannot yet clearly discern; but if they lead to truth, we shall not regret our journey through this dark region of ancient history, in which, while  
we

we proceed step by step, and follow every glimmering of certain light that presents itself, we must beware of those false rays and luminous vapours which mislead *Asiatic* travellers, by an appearance of water, but are found, on a near approach, to be deserts of sand.



I.

THE SIXTH

DISCOURSE,

ON

THE PERSIANS.

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DELIVERED 19 FEBRUARY, 1789.

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GENTLEMEN,

I Turn with delight from the vast mountains and barren deserts of *Turàn*, over which we travelled last year, with no perfect knowledge of our course, and request you now to accompany me on a literary journey through one of the most celebrated and most beautiful countries in the world; a country, the history and languages of which, both ancient and modern, I have long attentively studied, and on which I may, without arrogance, promise you more positive information than I could possibly procure on a nation so disunited and so unlettered as the *Tartars*: I mean that which *Europeans* improperly call *Persia*; the name of a single province being applied to the whole empire of *Iràn*, as it is correctly denominated by the present natives of it, and by all the learned *Muſlimans* who reside in these *British* territories. To give you an idea of its largest boundaries, agreeably to my former mode of describing *India*,

*Arabia*, and *Tartary*, between which it lies, let us begin with the source of the great *Affyrian* stream, *Euphrates* (as the *Greeks*, according to their custom, were pleased to miscall the *Forêt*) and thence descend to its mouth in the *Green Sea*, or *Persian Gulf*, including in our line some considerable districts and towns on both sides of the river; then, coasting *Persia*, properly so named, and other *Iranian* provinces, we come to the delta of the *Sindhu* or *Indus*; whence, ascending to the mountains of *Cashghur*, we discover its fountains and those of the *Jaihun*, down which we are conducted to the *Caspian*, which formerly, perhaps, it entered, though it loses itself now in the sands and lakes of *Khvárezm*. We next are led from the sea of *Khosar*, by the banks of the *Cur*, or *Cyrus*, and along the *Caucasian* ridges to the shore of the *Euxine*, and thence, by the several *Grecian* seas, to the point whence we took our departure, at no considerable distance from the *Mediterranean*. We cannot but include the *Lower Asia* within this outline, because it was unquestionably a part of the *Persian*, if not of the old *Affyrian*, empire; for we know that it was under the dominion of CAIKHOSRAU; and DIODORUS, we find, asserts that the kingdom of *Troas* was dependent on *Affyria*; since PRIAM implored and obtained succours from his Emperor TEUTAMES, whose name approaches nearer to TAHMU'RAS than to that of any other *Affyrian* monarch. Thus may we look on *Irân* as the noblest island (for so the *Greeks* and the *Arabs* would have called it) or at least as the noblest peninsula on this habitable globe; and if M. BAILLY had fixed on it as the *Atlantis* of PLATO, he might have supported his opinion with far stronger arguments than any that he has adduced in favour of *New Zembla*. If the account, indeed, of the *Atlantes* be not purely an *Egyptian*, or an *Utopian* fable, I should be more inclined to place them in *Irân* than in any region with which I am acquainted.

It may seem strange, that the ancient history of so distinguished an empire should be yet so imperfectly known; but very satisfactory reasons may be assigned for our ignorance of it: the principal of them are the superficial knowledge of the *Greeks* and *Jews*, and the loss of *Persian* archives, or historical compositions. That the *Grecian* writers, before XENOPHON, had *no* acquaintance with *Persia*, and that *all* their accounts of it are *wholly* fabulous, is a paradox too extravagant to be seriously maintained; but their connexion with it in war or peace had, indeed, been generally confined to bordering kingdoms under feudatory princes; and the first *Persian* Emperor, whose life and character they seem to have

known with tolerable accuracy, was the great CYRUS, whom I call, without fear of contradiction, CAIKHOSRAU; for I shall then only doubt that the KHOSRAU of FIRDAUSI' was the CYRUS of the first *Greek* historian, and the Hero of the oldest political and moral romance, when I doubt that LOUIS *Quatorze* and LEWIS *the Fourteenth* were one and the same *French* King. It is utterly incredible that two different princes of *Persia* should each have been born in a foreign and hostile territory; should each have been doomed to death in his infancy by his maternal grandfather in consequence of portentous dreams, real or invented; should each have been saved by the remorse of his destined murderer, and should each, after a similar education among herdsmen as the son of a herdsman, have found means to revisit his paternal kingdom; and having delivered it, after a long and triumphant war, from the tyrant who had invaded it, should have restored it to the summit of power and magnificence. Whether so romantic a story, which is the subject of an Epic Poem, as majestic and entire as the *Iliad*, be historically true, we may feel perhaps an inclination to doubt; but it cannot with reason be denied, that the outline of it related to a single Hero, whom the *Asiatics*, conversing

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with the father of *European* history, described according to their popular traditions by his true name, which the *Greek* alphabet could not express; nor will a difference of names affect the question, since the *Greeks* had little regard for truth, which they sacrificed willingly to the grace of their language, and the nicety of their ears; and, if they could render foreign words melodious, they were never solicitous to make the exact: hence they probably formed CAMBYSES from CA'MBAKHSI, or *granting desires*, a title rather than a name; and XERXES from SHI'RUVI, a prince and warrior in the *Sháhnámah*, or from SHI'RSHA, which might also have been a title; for the *Asiatic* princes have constantly assumed new titles or epithets at different periods of their lives, on different occasions: a custom which we have seen prevalent in our own times both in *Iran* and *Hindustan*, and which has been a source of great confusion even in the scriptural accounts of *Babylonian* occurrences: both *Greeks* and *Jews* have in fact accommodated *Persian* names to their own articulation; and both seem to have disregarded the native literature of *Iran*, without which they could at most attain a general and imperfect knowledge of the country. As to the *Persians* themselves who were contemporary with the *Jews* and *Greeks*, they must have been acquainted with the history of their own times, and with the traditional accounts of past ages; but for a reason, which will presently appear, they chose to consider CAYUMERS as the founder of their empire; and in the numerous distractions which followed the overthrow of DA'RA, especially in the great revolution on the defeat of YEZDEGIRD, the civil histories were lost, as those of *India* have unhappily been, from the solicitude of the priests, the only depositaries of their learning, to preserve their books of law and religion at the expence of all other. Hence it has happened that nothing remains of genuine *Persian* history

before

before the dynasty of SA'SA'N, except a few rustic traditions and fables, which furnished materials for the *Sháhnámah*, and which are still supposed to exist in the *Pahlavi* language. The annals of the *Pishdadí*, or *Assyrian* race, must be considered as dark and fabulous; and those of the *Cayání* family, or the *Medes* and *Persians*, as heroic and poetical, though the lunar eclipses, said to be mentioned by PTOLEMY, fix the time of GUSHTASP, the prince by whom ZERA'TUSHT was protected. Of the *Parthian* kings, descended from ARSHAC, or ARSACES, we know little more than the names; but the *Sásánis* had so long an intercourse with the Emperors of *Rome* and *Byzantium*, that the period of their dominion may be called an historical age. In attempting to ascertain the beginning of the *Assyrian* empire, we are deluded, as in a thousand instances, by names arbitrarily imposed. It had been settled by chronologers, that the first monarchy established in *Persia* was the *Assyrian*; and NEWTON, finding some of opinion that it rose in the first century after the Flood, but unable, by his own calculations, to extend it farther back than *seven hundred and ninety* years before CHRIST, rejected part of the old system, and adopted the rest of it; concluding, that the *Assyrian* monarchs began to reign about two hundred years after SOLOMON; and that, in all preceding ages, the government of *Irán* had been divided into several petty states and principalities. Of this opinion I confess myself to have been; when, disregarding the wild chronology of the *Muselmans* and *Gabrs*, I had allowed the utmost natural duration to the reigns of eleven *Pishdadí* kings, without being able to add more than a hundred years to NEWTON's computation. It seemed, indeed, unaccountably strange that, although ABRAHAM had found a regular monarchy in *Egypt*; although the kingdom of *Yemen* had just pretensions to very high antiquity; although the *Chinese*, in the twelfth century before our era, had made approaches at least

least to the present form of their extensive dominion; and although we can hardly suppose the first *Indian* monarchs to have reigned less than three thousand years ago, yet *Persia*, the most delightful, the most compact, the most desirable country of them all, should have remained for so many ages unsettled and disunited. A fortunate discovery, for which I was first indebted to *Mir MUHAMMED HUSAIN*, one of the most intelligent *Muselmans* in *India*, has at once dissipated the cloud, and cast a gleam of light on the primeval history of *Iran*, and of the human race, of which I had long despaired, and which could hardly have dawned from any other quarter.

THE rare and interesting tract on *twelve different religions*, entitled the *Dabistân*, and composed by a *Mohammedan* traveller, a native of *Cashmîr*, named *MOHSAN*, but distinguished by the assumed surname of *FA'NÎ*, or *Perishable*, begins with a wonderfully curious chapter on the religion of *HU'SHANG*, which was long anterior to that of *ZERA'TUSHT*, but had continued to be secretly professed by many learned *Persians* even to the author's time; and several of the most eminent of them, dissenting in many points from the *Gabrs*, and persecuted by the ruling powers of their country, had retired to *India*; where they compiled a number of books, now extremely scarce, which *MOHSAN* had perused, and with the writers of which, or with many of them, he had contracted an intimate friendship. From them he learned, that a powerful monarchy had been established for ages in *Iran* before the accession of *CAYUMERS*, that it was called the *Mahabadian* Dynasty, for a reason which will soon be mentioned, and that many princes, of whom seven or eight only are named in the *Dabistân*, and among them *MAHEUL*, or *MAHA' BELI*, had raised their empire to the zenith of human glory. If

we can rely on this evidence, which to me appears unexceptionable, the *Iranian* monarchy must have been the oldest in the world; but it will remain dubious to which of the three stocks, *Hindu*, *Arabian*, or *Tartar*, the first Kings of *Irán* belonged, or whether they sprang from a fourth race distinct from any of the others; and these are questions which we shall be able, I imagine, to answer precisely, when we have carefully inquired into the *languages* and *letters*, *religion* and *philosophy*, and incidentally into the *arts* and *sciences* of the ancient *Persians*.

I. IN the new and important remarks which I am going to offer on the ancient *languages* and *characters* of *Irán*, I am sensible that you must give me credit for many assertions, which on this occasion it is impossible to prove; for I should ill deserve your indulgent attention, if I were to abuse it by repeating a dry list of detached words, and presenting you with a vocabulary instead of a dissertation; but, since I have no system to maintain, and have not suffered imagination to delude my judgment; since I have habituated myself to form opinions of men and things from *evidence*, which is the only solid basis of *civil*, as *experiment* is of *natural* knowledge; and since I have maturely considered the questions which I mean to discuss, you will not, I am persuaded, suspect my testimony, or think that I go too far, when I assure you that I will assert nothing positively which I am not able satisfactorily to demonstrate. When MUHAMMED was born, and ANU'SHI'RAVA'N, whom he calls *the Just King*, sat on the throne of *Persia*, two languages appear to have been generally prevalent in the great empire of *Irán*; that of the *court*, thence named *Deri*, which was only a refined and elegant dialect of the *Parsi*, so called from the province, of which *Shiráz* is now the capital; and that of the learned, in which most books were composed, and which

had the name of *Pahlavî*, either from the *heroes*, who spoke it in former times, or from *Pahlu*, a track of land, which included, we are told, some considerable cities of *Irâk*: the ruder dialects of both were, and, I believe, still are spoken by the rustics in several provinces; and in many of them, as *Herât*, *Zabul*, *Sîstân*, and others, distinct idioms were vernacular, as it happens in every kingdom of great extent. Besides the *Pârsî* and *Pahlavî*, a very ancient and abstruse tongue was known to the priests and philosophers, called *the language of the Zend*, because a book on religious and moral duties, which they held sacred, and which bore that name, had been written in it; while the *Pâzend*, or comment on that work, was composed in *Pahlavî*, as a more popular idiom; but a learned follower of ZERA'TUSHT, named BAHMAN, who lately died at *Calcutta*, where he had lived with me as a *Persian* reader about three years, assured me that the letters of his prophet's book were properly called *Zend*, and the language *Avestâ*, as the words of the *Vêdas* are *Sanserit*, and the characters *Nâgarî*: or as the old *Sagas* and poems of *Iceland* were expressed in *Runic* letters. Let us however, in compliance with custom, give the name of *Zend* to the sacred language of *Persia*, until we can find, as we shall very soon, a fitter appellation for it. The *Zend* and the old *Pahlavî* are almost extinct in *Irân*; for among six or seven thousand *Gubrs*, who reside chiefly at *Yezd* and in *Cirmân*, there are very few who can read *Pahlavî*, and scarce any who even boast of knowing the *Zend*; while the *Pârsî*, which remains almost pure in the *Shâhnâmâh*, has now become by the intermixture of numberless *Arabic* words, and many imperceptible changes, a new language exquisitely polished by a series of fine writers in prose and verse, and analogous to the different idioms gradually formed in *Europe* after the subversion of the *Roman* empire: but with modern

*Persian*

*Persian* we have no concern in our present inquiry, which I confine to the ages that preceded the *Mohammedan* conquest. Having twice read the works of FIRDAUSI' with great attention, since I applied myself to the study of old *Indian* literature, I can assure you with confidence, that hundreds of *Pársi* nouns are pure *Sanſcrit*, with no other change than ſuch as may be obſerved in the numerous *bháſhàs*, or vernacular dialects of *India*; that very many *Persian* imperatives are the roots of *Sanſcrit* verbs; and that even the moods and tenſes of the *Persian* verb-subſtantive, which is the model of all the reſt, are deducible from the *Sanſcrit* by an eaſy and clear analogy: we may hence conclude, that the *Pársi* was derived, like the various *Indian* dialects, from the language of the *Bráhmans*; and I muſt add, that in the pure *Persian* I find no trace of any *Arabian* tongue, except what proceeded from the known intercourse between the *Persians* and *Arabs*, eſpecially in the time of BAHRA'M, who was educated in *Arabia*, and whoſe *Arabic* verſes are ſtill extant, together with his heroic line in *Deri*, which many ſuppoſe to be the fiſt attempt at *Persian* verſification in *Arabian* metre: but without having recourſe to other arguments, *the compoſition of words*, in which the genius of the *Persian* delights and which that of the *Arabic* abhors, is a deciſive proof that the *Pársi* ſprang from an *Indian* and not from an *Arabian* ſtock. Conſidering languages as mere inſtruments of knowledge, and having ſtrong reaſons to doubt the exiſtence of genuine books in *Zend* or *Pahlaví* (eſpecially ſince the well-informed author of the *Dabſſán* affirms the work of ZERA'TUSHT to have been loſt, and its place ſupplied by a recent compilation) I had no inducement, though I had an opportunity, to learn what remains of thoſe ancient languages; but I often converſed on them with my friend BAHMAN; and both of us were convinced after full conſideration, that the *Zend* bore a ſtrong reſemblance to *Sanſcrit*, and the

*Pahlavi* to *Arabic*. He had at my request translated into *Pahlavi* the fine inscription exhibited in the *Gulistan*, on the diadem of CYRUS; and I had the patience to read the list of words from the *Pâzend*, in the appendix to the *Farhang-i Jehângîrî*. This examination gave me perfect conviction that the *Pahlavi* was a dialect of the *Chaldaic*; and of this curious fact I will exhibit a short proof. By the nature of the *Chaldean* tongue, most words ended in the first long vowel like *shemiâ*, heaven; and that very word, unaltered in a single letter, we find in the *Pâzend*, together with *lulû*, night; *meyâ*, water; *nîrâ*, fire; *matrâ*, rain; and a multitude of others, all *Arabic* or *Hebrew*, with a *Chaldean* termination: so *zamar*, by a beautiful metaphor from *pruning-trees*, means in *Hebrew* to *compose verses*, and thence, by an easy transition, to *sing* them; and in *Pahlavi* we see the verb *zamrâniten*, to *sing*, with its forms *zam-rînem*, I *sing*; and *zamrânid*, he *sang*; the verbal terminations of the *Persian* being added to the *Chaldaic* root. Now all those words are integral parts of the language, not adventitious to it, like the *Arabic* nouns and verbals engrafted on modern *Persian*; and this distinction convinces me that the dialect of the *Gubrs*, which they pretend to be that of ZERA'TUSHT, and of which BAHMAN gave me a variety of written specimens, is a late invention of their priests, or subsequent at least to the *Muselman* invasion; for, although it may be possible that a few of their sacred books were preserved, as he used to assert, in sheets of lead or copper at the bottom of wells near *Yezd*, yet as the conquerors had not only a spiritual, but a political interest in persecuting a warlike, robust, and indignant race of irreconcilable conquered subjects, a long time must have elapsed before the hidden scriptures could have been safely brought to light, and few who could perfectly understand them must then have remained; but, as they continued to profess among themselves the religion

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of their forefathers, it became expedient for the *Mábeds* to supply the lost or mutilated works of their legislator by new compositions, partly from their imperfect recollection, and partly from such moral and religious knowledge as they gleaned, most probably, among the *Christians*, with whom they had an intercourse. One rule we may fairly establish in deciding the question, whether the books of the modern *Gabrs* were anterior to the invasion of the *Arabs*: when an *Arabic* noun occurs in them, changed only by the spirit of the *Chaldean* idiom, as *wertà* for *wend*, a rose; *dabà* for *dhahab*, gold; or *demàn* for *zeman*, time, we may allow it to have been ancient *Pahlavi*; but when we meet with verbal nouns or infinitives, evidently formed by the rules of *Arabian* grammar, we may be sure that the phrases in which they occur are comparatively modern; and not a single passage which *BAHMAN* produced from the books of his religion would abide this test.

WE come now to the language of the *Zend*: and here I must impart a discovery which I lately made, and from which we may draw the most interesting consequences. *M. ANQUTIN*, who had the merit of undertaking a voyage to *India* in his earliest youth, with no other view than to recover the writings of *ZERATUSHT*, and who would have acquired a brilliant reputation in *France*, if he had not sullied it by his immoderate vanity and virulence of temper, which alienated the good-will even of his own countrymen, has exhibited in his work entitled *Zendâvestâ*, two vocabularies in *Zend* and *Pahlavi*, which he had found in an approved collection of *Rawâýât*, or *Traditional Pieces*, in modern *Persian*. Of his *Pahlavi* no more needs be said, than that it strongly confirms my opinion concerning the *Chaldaic* origin of that language; but, when I perused the *Zend* glossary, I was inexpressibly surprized to find



find, that six or seven words in ten were pure *Sanſcrit*, and even ſome of their inflections formed by the rules of the *Vyâcaran*; as *yufhmâcan*, the genitive plural of *yufhmad*. Now M. ANQUETIL moſt certainly, and the *Perſian* compiler moſt probably, had no knowledge of *Sanſcrit*; and could not, therefore, have invented a liſt of *Sanſcrit* words. It is therefore, an authentic liſt of *Zend* words which had been preſerved in books or by tradition; and it follows, that the language of the *Zend* was at leaſt a dialect of the *Sanſcrit*, approaching perhaps as nearly to it as the *Prâcrit*, or other popular idioms, which we know to have been ſpoken in *India* two thouſand years ago. From all theſe facts it is a neceſſary conſequence, that the oldeſt diſcoverable languages of *Perſia* were *Chaldaic* and *Sanſcrit*; and that, when they had ceaſed to be vernacular, the *Pahlavî* and *Zend* were deduced from them reſpectively; and the *Pèrſi* either from the *Zend* or immediately from the dialect of the *Brahmans*; but all had perhaps a mixture of *Tartarian*; for the beſt lexicographers aſſert, that numberleſs words in ancient *Perſian* are taken from the language of the *Commerians*, or the *Tartars* of *Kipchik*; ſo that the three families, whoſe lineage we have examined in former diſcourſes, had left viſible traces of themſelves in *Irân*, long before the *Tartars* and *Arabs* had ruſhed from their deſerts, and returned to that very country from which in all probability they originally proceeded, and which the *Hindus* had abandoned in an earlier age, with poſitive commands from their legiſlators to reſiſt it no more. I cloſe this head with obſerving, that no ſuppoſition of a mere political or commercial intercourſe between the different nations will account for the *Sanſcrit* and *Chaldaic* words, which we find in the old *Perſian* tongues; becauſe they are, in the firſt place, too numerous to have been introduced by ſuch means; and ſecondly, are not the names of exotic animals, commodities,

modities, or arts, but those of material elements, parts of the body, natural objects and relations, affections of the mind, and other ideas common to the whole race of man.

If a nation of *Hindus*, it may be urged, ever possessed and governed the country of *Irân*, we should find on the very ancient ruins of the temple or palace, now called *the throne of JEMSHÍ'D*, some inscriptions in *Dévanágarí*, or at least in the characters on the stones at *Elephanta*, where the sculpture is unquestionably *Indian*, or in those on the *Staff of FÍRÚ'Z SHA'H*, which exist in the heart of *India*; and such inscriptions we probably should have found, if that edifice had not been created after the migration of the *Bráhmans* from *Irân*, and the violent schism in the *Persian* religion, of which we shall presently speak; for although the popular name of the building at *Istakhr*, or *Perspolis*, be no certain proof that it was raised in the time of JEMSHÍ'D, yet such a fact might easily have been preserved by tradition; and we shall soon have abundant evidence that the temple was posterior to the reign of the *Hindu* monarchs. The *cypresses* indeed, which are represented with the figures in procession, might induce a reader of the *Shahnámah* to believe, that the sculptures related to the new faith introduced by ZERÁTUSHT; but, as a cypress is a beautiful ornament, and as many of the figures appear inconsistent with the reformed adoration of fire, we must have recourse to stronger proofs, that the *Takht* JEMSHÍ'D was erected after CAYÚMERS. The building has lately been visited, and the characters on it examined, by Mr. FRANKLIN; from whom we learn, that NIEBUHR has delineated them with great accuracy: but without such testimony I should have suspected the correctness of the delineation; because the *Danish* traveller has exhibited two inscriptions in modern *Persian*, and one of them from

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the same place, which cannot have been exactly transcribed; they are very elegant verses of NIZÂMI' and SADÏ' on *the instability of human greatness*; but so ill engraved or so ill copied, that, if I had not had them nearly by heart, I should not have been able to read them: and M. ROUSSEAU of *Isfahan*, who translated them with shameful inaccuracy, must have been deceived by the badness of the copy, or he never would have created a new king WAKAM, by forming one word of JEM and the particle prefixed to it. Assuming, however, that we may reason as conclusively on the characters published by NIEBUHR as we might on the monuments themselves, were they now before us, we may begin with observing, as CHARTIN had observed on the very spot, that they bear no resemblance whatever to the letters used by the *Gabrs* in their copies of the *Zend*: this I once urged, in an amicable debate with BAHMAN, as a proof that the *Zend* letters were a modern invention; but he seemed to hear me without surprize, and insisted that the letters to which I alluded, and which he had often seen, were monumental characters, never used in books, and intended either to conceal some religious mysteries from the vulgar, or to display the art of the sculptor, like the embellished *Ussik* and *Nigari* on several *Arabian* and *Indian* monuments. He wondered that any man could seriously doubt the antiquity of the *Pahlavi* letters, and in truth the inscription behind the horse of *Rustam*, which NIEBUHR has also given us, is apparently *Pahlavi*, and might with some pains be decyphered: that character was extremely rude, and seems to have been written, like the *Roman* and the *Arabic*, in a variety of hands, for I remember to have examined a rare collection of old *Persian* coins in the museum of the great Anatomist WILLIAM HUNTER, and, though I believed the legends to be *Pahlavi*, and had no doubt that they were coins of *Parthian* kings, yet I could not read the inscriptions

inscriptions without wasting more time than I had then at command in comparing the letters, and ascertaining the proportions in which they severally occurred. The gross *Pahlavi* was improved by ZERATUSHT or his disciples into an elegant and perspicuous character, in which the *Zendávestâ* was copied; and both were written from the right hand to the left, like other *Chaldaic* alphabets; for they are manifestly both of *Chaldean* origin; but the *Zend* has the singular advantage of expressing all the long and short vowels, by distinct marks, in the body of each word, and all the words are distinguished by full points between them; so that if modern *Persian* were unmixed with *Arabic*, it might be written in *Zend* with the greatest convenience, as any one may perceive by copying in that character a few pages of the *Shâhnámah*. As to the unknown inscriptions in the palace of JEMSHID, it may reasonably be doubted whether they contain a system of letters which any nation ever adopted: in *five* of them the letters, which are separated by points, may be reduced to forty, at least I can distinguish no more essentially different; and they all seem to be regular variations and compositions of a straight line and an angular figure like the head of a javelin, or a leaf (to use the language of botanists) *hearted and lanced*. Many of the *Runick* letters appear to have been formed of similar elements; and it has been observed, that the writing at *Persepolis* bears a strong resemblance to that which the *Irish* call *Ogham*: the word *Agam* in *Sanscrit* means *mysterious knowledge*; but I dare not affirm that the two words had a common origin, and only mean to suggest that, if the characters in question be really alphabetical, they were probably secret and sacerdotal, or a mere cypher, perhaps, of which the priests only had the key. They might, I imagine, be decyphered, if the language were certainly known; but, in all the other inscriptions of the same

fort, the characters are too complex, and the variations of them too numerous, to admit an opinion that they could be symbols of articulate sounds; for even the *Nigari* system, which has more distinct letters than any known alphabet, consists only of forty-nine simple characters, two of which are mere substitutions, and four of little use in *Sanseri* or in any other language; while the more complicated figures, exhibited by NIEBUHR, must be as numerous at least as the *Chinese* keys, which are the signs of *ideas* only, and some of which resemble the old *Persian* letters at *Istakhr*. The *Danish* traveller was convinced from his own observation, that they were written from the left hand, like all the characters used by *Hindu* nations; but I must leave this dark subject, which I cannot illuminate, with a remark formerly made by myself, that the square *Chaldaic* letters, a few of which are found on the *Persian* ruins, appear to have been originally the same with the *Devanagari*, before the latter were enclosed, as we now see them, in angular frames.

II. THE primeval religion of *Iràn*, if we rely on the authorities adduced by MOHSANI FA'NI', was that which NEWTON calls the oldest (and it may justly be called the noblest) of all religions: "a firm belief  
 " that One Supreme GOD made the world by his power, and continu-  
 \* ally governed it by his providence; a pious fear, love, and adoration  
 " of Him; a due reverence for parents and aged persons; a fraternal  
 " affection for the whole human species, and a compassionate tenderness  
 " even for the brute creation." A system of devotion so pure and sublime could hardly among mortals be of long duration; and we learn from the *Dabistân*, that the popular worship of the *Iránians* under HU'S-HANG was purely *Sabian*: a word, of which I cannot offer any certain etymology, but which has been deduced by grammarians from *Sabâ, an*  
*hoft,*

*host* and, particularly the *host of heaven*, or the *celestial bodies*, in the adoration of which the *Sabian* ritual is believed to have consisted. There is a description in the learned work just mentioned, of the several *Persian* temples dedicated to the Sun and Planets, of the images adored in them, and of the magnificent processions to them on prescribed festivals, one of which is probably represented by sculpture in the ruined city of JEMSHID; but the planetary worship in *Persia* seems only a part of a far more complicated religion, which we now find in these *Indian* provinces; for MONTAN assures us, that, in the opinion of the best informed *Persians*, who professed the faith of HU'SHANG, distinguished from that of ZERA'TUSHT the first monarch of *Irân* and of the whole earth was MAHA'BA'D, a word apparently *Sanseerit*, who divided the people into four orders, the *religious*, the *military*, the *commercial*, and the *servile*, to which he assigned names unquestionably the same in their origin with those now applied to the four primary classes of the *Hindus*. They added, that he received from the Creator, and promulgated among men, a  *sacred book in a heavenly language*, to which the *Musliman* author gives the *Arabic* title of *Defätir*, or Regulations, but the original name of which he has not mentioned; and that *fourteen* MAHA'BA'Ds had appeared or would appear in human shapes, for the government of this world. Now when we know that the *Hindus* believe in *fourteen* MENUS, or celestial personages with similar functions, the *first* of whom left a book of *regulations*, or *divine ordinances*, which they hold equal to the *Veda*, and the language of which they believe to be that of the Gods, we can hardly doubt that the first corruption of the purest and oldest religion was the system of *Indian* Theology invented by the *Brâhmans*, and prevalent in these territories where the book of MAHA'BA'D or MENU is at this hour the standard of all religious and moral duties. The accession of CAYUMERS to the

throne of *Persia*, in the eighth or ninth century before CHRIST, seems to have been accompanied by a considerable revolution both in government and religion: he was most probably of a different race from the *Mahabadians*, who preceded him, and began perhaps the new system of national faith which HU'SHANG, whose name it bears, completed; but the reformation was partial; for, while they rejected the complex polytheism of their predecessors, they retained the laws of MAHA'BA'D, with a superstitious veneration for the sun, the planets, and fire; thus resembling the *Hindu* sects, called *Sauras* and *Ságnicas*, the second of which is very numerous at *Banares*, where many *agnihótras* are continually blazing, and where the *Ságnicos*, when they enter on their sacerdotal office, kindle, with two pieces of the hard wood *Semi*, a fire which they keep lighted through their lives for their nuptial ceremony, the performance of solemn sacrifices, the obsequies of departed ancestors, and their own funeral pile. This remarkable rite was continued by ZERA'TUSHT; who reformed the old religion by the addition of genii, or angels, presiding over months and days, of new ceremonics in the veneration shown to fire, of a new work, which he pretended to have received from heaven, and, above all, by establishing the actual adoration of One Supreme Being. He was born, according to MOHSAN, in the district of *Rai*; and it was he, not (as AMMIANUS asserts) his protector GUSHTASB, who travelled into *India*, that he might receive information from the *Bráhmans* in theology and ethics. It is barely possible that PYTHAGORAS knew him in the capital of *Irak*; but the *Grecian* sage must then have been far advanced in years, and we have no certain evidence of an intercourse between the two philosophers. The reformed religion of *Persia* continued in force till that country was subdued by the *Muselmans*; and, without studying the *Zend*, we have ample information concerning it

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in the modern *Persian* writings of several who professed it. BAHMAN always named ZERA'TUSHT with reverence; but he was in truth a pure Theist, and strongly disclaimed any adoration of the *fire* or other elements: he denied that the doctrine of two coeval principles, supremely good and supremely bad, formed any part of his faith; and he often repeated with emphasis the verses of FIRDAUSI on the prostration of CYRUS and his paternal grandfather before the blazing altar: "Think not that they were adorers of fire; for that element was only an exalted object, on the lustre of which they fixed their eyes; they humbled themselves a whole week before GOD; and, if thy understanding be ever so little exerted, thou must acknowledge thy dependence on the Being supremely pure." In a story of SADI, near the close of his beautiful *Bûstân*, concerning the idol of SO'MANA'TH, or MAHA'DE'VA, he confounds the religion of the *Hindus* with that of the *Gabrs*, calling the *Brâhmans* not only *Moghs* (which might be justified by a passage in the *Mefnavî*) but even readers of the *Zend* and *Pûzend*. Now, whether this confusion proceeded from real or pretended ignorance, I cannot decide, but am as firmly convinced that the doctrines of the *Zend* were distinct from those of the *Veda*, as I am that the religion of the *Brâhmans*, with whom we converse every day, prevailed in *Persia* before the accession of CAYUMERS, whom the *Pûrsis*, from respect to his memory, consider as the first of men, although they believe in an *universal deluge* before his reign.

WITH the religion of the old *Persians*, their *philosophy* (or as much as we know of it) was intimately connected; for they were assiduous observers of the luminaries, which they adored, and established (according to MOHSAN, who confirms in some degree the fragments of BIFOSCUS)

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a number of artificial cycles with distinct names, which seem to indicate a knowledge of the period in which the equinoxes appear to revolve. They are said also to have known the most wonderful powers of nature, and thence to have acquired the fame of magicians and enchanters : but I will only detain you with a few remarks on that metaphysical theology, which has been professed immemorially by a numerous sect of *Persians* and *Hindus*, was carried in part into *Greece*, and prevails even now among the learned *Muselmans*, who sometimes avow it without reserve. The modern philosophers of this persuasion are called *Sîffis*, either from the *Greek* word for a *sage*, or from the *woollen* mantle which they used to wear in some provinces of *Persia*. Their fundamental tenets are, that nothing exists absolutely but GOD : that the human soul is an emanation from his essence, and though divided for a time from its heavenly source, will be finally reunited with it ; that the highest possible happiness will arise from its reunion, and that the chief good of mankind in this transitory world, consists in as perfect an union with the Eternal Spirit as the incumbrances of a mortal frame will allow ; that, for this purpose, they should break all connexion (or *taâlluk*, as they call it) with extrinsic objects, and pass through life without attachments, as a swimmer in the ocean strikes freely without the impediment of clothes ; that they should be straight and free as the cypress, whose fruit is hardly perceptible, and not sink under a load, like fruit-trees attached to a trellis ; that, if mere earthly charms have power to influence the soul, the idea of celestial beauty must overwhelm it in extatic delight ; that for want of apt words to express the divine perfections and the ardour of devotion, we must borrow such expressions as approach the nearest to our ideas, and speak of *Beauty* and *Love* in a transcendent and mystical sense ; that, like a *reed* torn from its native bank, like *wax* separated from

from its delicious honey, the soul of man bewails its disunion with *melancholy music*, and sheds burning tears, like the lighted taper, waiting passionately for the moment of its extinction, as a disengagement from earthly trammels, and the means of returning to its Only Beloved. Such in part (for I omit the minuter and more subtil metaphysics of the *Sîfis*, which are mentioned in the *Dabistân*) is the wild and enthusiastic religion of the modern *Persian* poets, especially of the sweet HA'FIZ and the great *Maulavî*: such is the system of the *Védants* philosophers and best lyric poets of *India*; and, as it was a system of the highest antiquity in both nations, it may be added to the many other proofs of an immemorial affinity between them.

III. ON the ancient *monuments* of *Persian* sculpture and architecture, we have already made such observations as were sufficient for our purpose; nor will you be surprized at the diversity between the figures at *Elephanta*, which are manifestly *Hindu*, and those at *Persepolis*, which are merely *Sabian*, if you concur with me in believing that the *Takhti Jemshîd* was erected after the time of CAYU'MERS, when the *Brâhmans* had migrated from *Irân*, and when their intricate mythology had been superseded by the simpler adoration of the planets and of fire.

IV. As to the *sciences* or *arts* of the old *Persians*, I have little to say; and no complete evidence of them seems to exist. MOHSAN speaks more than once of ancient verses in the *Pahlavî* language; and BAHMAN assured me, that some scanty remains of them had been preserved: their music and painting, which NIZAMI celebrated, have irrecoverably perished; and in regard to MA'NÂ, the painter and impostor, whose book

of drawings, called *Atung*, which he pretended to be divine, is supposed to have been destroyed by the *Chinese*, in whose dominions he had sought refuge, the whole tale is too modern to throw any light on the questions before us concerning the origin of nations and the inhabitants of the primitive world.

Thus has it been proved by clear evidence and plain reasoning, that a powerful monarchy was established in *Iràn* long before the *Affyrian*, or *Pishdadî*, government; that it was in truth a *Hindu* monarchy, though if any chuse to call it *Custan*, *Casdean*, or *Scythian*, we shall not enter into a debate on mere names; that it subsisted many centuries, and that its history has been engrafted on that of the *Hindus*, who founded the monarchies of *Ayódhyâ* and *Indraprestha*; that the language of the first *Persian* empire was the mother of the *Sanscrit*, and consequently of the *Zend* and *Parsi*, as well as of *Greek*, *Latin*, and *Gothic*; that the language of the *Affyrians* was the parent of *Chaldaic* and *Pahlavi*; and that the primary *Tartarian* language also had been current in the same empire; although, as the *Tartars* had no books or even letters we cannot with certainty trace their unpolished and variable idioms. We discover, therefore in *Persia*, at the earliest dawn of history, the three distinct races of men, whom we described on former occasions, as possessors of *India*, *Arabia*, *Tartary*; and whether they were collected in *Iràn* from distant regions, or diverged from it as from a common centre, we shall easily determine by the following considerations. Let us observe, in the first place, the central position of *Iràn*, which is bounded by *Arabia*, by *Tartary*, and by *India*; whilst *Arabia* lies contiguous to *Iràn* only, but is remote from *Tartary*, and divided even from the skirts of *India* by a considerable gulf; not a country, therefore, but *Persia*.

seems likely to have sent forth its colonies to all the kingdoms of *Asia*: the *Bráhmans* could never have migrated from *India* to *Iràn*, because they are expressly forbidden by their oldest existing laws to leave the region which they inhabit at this day. The *Arabs* have not even a tradition of an emigration into *Persia* before MOHAMMED; nor had they indeed any inducement to quit their beautiful and extensive domains: and, as to the *Tartars*, we have no trace in history of their departure from their plains and forests till the invasion of the *Medes*, who, according to etymologists, were the sons of MADAI; and even they were conducted by princes of an *Assyrian* family. The *three* races, therefore, whom we have already mentioned (and more than three we have not yet found) migrated from *Iràn*, as from their common country; and thus the *Saxon* chronicle, I presume from good authority, brings the first inhabitants of *Britain* from *Armenia*; while a late very learned writer concludes, after all his laborious researches, that the *Goths*, or *Scythians*, came from *Persia*; and another contends with great force, that both the *Irish* and old *Britons* proceeded severally from the borders of the *Caspian*: a coincidence of conclusions, from different media, by persons wholly unconnected, which could scarce have happened if they were not grounded on solid principles. We may, therefore, hold this proposition firmly established, that *India*, or *Persia*, in its largest sense, was the true centre of population, of knowledge, of languages, and of arts; which, instead of travelling westward only, as it has been fancifully supposed, or eastward, as might with equal reason have been asserted, were expanded in all directions to all the regions of the world in which the *Hindu* race had settled under various denominations: but whether *Asia* has not produced other races of men, distinct from the *Hindus*, the *Arabs*, or the *Tartars*, or whether any apparent diversity may not have sprung from an intermixture of those

three in different proportions, must be the subject of a future enquiry. There is another question of more immediate importance, which you, Gentlemen, only can decide; namely, “by what means we can preserve our “Society from dying gradually away, as it has advanced gradually to its “present (shall I say flourishing or languishing?) state.” It has subsisted five years without any expence to the members of it, until the first volume of our Transactions was published; and the price of that large volume, if we compare the different values of money in *Bengal* and in *England*, is not more than equal to the *annual* contribution towards the charges of the Royal Society by each of its fellows, who may not have chosen to compound for it on his admission. This I mention, not from an idea that any of us could object to the purchase of one copy at least, but from a wish to inculcate the necessity of our common exertions in promoting the sale of the work both here and in *London*. In vain shall we meet, as a literary body, if our meetings shall cease to be supplied with original dissertations and memorials; and in vain shall we collect the most interesting papers, if we cannot publish them occasionally without exposing the Superintendants of the Company’s press, who undertake to print them at their own hazard, to the danger of a considerable loss. By united efforts the *French* have compiled their stupendous repositories of universal knowledge; and by united efforts only can we hope to rival them, or to diffuse over our own country and the rest of *Europe*, the lights attainable by our *Asiatic Researches*.

## IV.

### A LETTER

FROM THE LATE HENRY VANSITTART, ESQ.

TO THE PRESIDENT.

SIR,

HAVING some time ago met with a *Persian* abridgement, composed by *Maulavi* KHAIRU'DDIN, of the *âfrâru'l afâghinah*, or the secrets of the *Afghans*, a book written in the *Pushto* language by HUSAIN, the son of SA'BIR, the son of KHIZR, the disciple of *Hazrat* SHA'H KA'SIM *Sulaimânî*, whose tomb is in *Chunârgur*, I was induced to translate it. Although it opens with a very wild description of the origin of that tribe, and contains a narrative which can by no means be offered upon the whole as a serious and probable history, yet I conceive that the knowledge of what a nation suppose themselves to be, may be interesting to a Society like this, as well as of what they really are. Indeed, the commencement of almost every history is fabulous; and the most enlightened nations, after they have arrived at that degree of civilization and importance which has enabled and induced them to commemorate their actions, have always found a vacancy at their outset, which invention, or at best presumption, must supply. Such fictions appear at first in the form of traditions; and, having in this shape amused successive generations by a gratification of their national vanity, they are committed to writing, and acquire the authority of history.

As a kingdom is an assemblage of component parts, condensed by degrees from smaller associations of individuals to their general union, so history is a combination of the transactions not only of the different tribes, but even of the individuals of the nation of which it treats. Each particular narrative, in such a general collection, must be summary and incomplete. Biography, therefore, as well as descriptions of the manners, actions, and even opinions of such tribes as are connected with a great kingdom, are not only entertaining in themselves, but useful, as they explain and throw a light upon the history of the nation.

UNDER these impressions I venture to lay before the Society the translation of an abridged history of the *Afghans*; a tribe at different times subject to, and always connected with, the kingdoms of *Persia* and *Hindustan*. I also submit a specimen of their language, which is called by them *Pukhto*; but this word is softened in *Persian* into *Pushto*.

I am, Sir,

With the greatest respect,

Your most obedient humble servant,

HENRY VANSITTART.

*Calcutta, March 3, 1784.*

## ON THE DESCENT OF THE AFGHANS FROM THE JEWS.

THE *Afghans*, according to their own traditions, are the posterity of MELIC TA'LU'T (king SAUL) who, in the opinion of some, was a descendant of JUDAH, the son of JACOB; and according to others, of BENJAMIN, the brother of JOSEPH.

IN a war which raged between the children of *Israel* and the *Amalekites*, the latter being victorious, plundered the *Jews*, and obtained possession of the ark of the covenant. Considering this the God of the *Jews*, they threw it into fire, which did not affect it. They afterwards attempted to cleave it with axes, but without success: every individual who treated it with indignity, was punished for his temerity. They then placed it in their temple, but all their idols bowed to it. At length they fastened it upon a cow, which they turned loose in the wilderness.

WHEN the Prophet Samuel arose, the children of *Israel* said to him, "We have been totally subdued by the *Amalekites*, and have no king: raise to us a king, that we may be enabled to contend for the glory of God." SAMUEL said, "In case you are led out to battle, are you determined to fight?" They answered, "What has befallen us that we should not fight against infidels? That nation has banished us from our country and children." At this time the angel GABRIEL descended, and, delivering a wand, said, "It is the command of God, that the person whose stature shall correspond with this wand, shall be king of *Israel*."



MELIC TA'LU'T was at that time a man of inferior condition, and performed the humble employment of feeding the goats and cows of others. One day a cow under his charge was accidentally lost. Being disappointed in his searches he was greatly distressed, and applied to SAMUEL, saying, "I have lost a cow, and do not possess the means of satisfying the owner. Pray for me, that I may be extricated from this difficulty." SAMUEL, perceiving that he was a man of lofty stature, asked his name. He answered, TA'LU'T. SAMUEL then said, "Measure TA'LU'T with the wand which the angel GABRIEL brought." His stature was equal to it. SAMUEL then said, GOD has raised TA'LU'T to be your king." The children of *Israel* answered, "We are greater than our king. We are men of dignity, and he is of inferior condition: how shall he be our king?" SAMUEL informed them they should know that God had constituted TA'LU'T their king, by his restoring the ark of the covenant. He accordingly restored it, and they acknowledged him their sovereign.

AFTER TA'LU'T obtained the kingdom, he seized part of the territories of JALU'T, or GOLIAH, who assembled a large army, but was killed by DAVID. TA'LU'T afterwards died a martyr in a war against the infidels; and God constituted DAVID king of the *Jews*.

MELIC TA'LU'T had two sons, one called BERKIA and the other IRMIA, who served DAVID, and were beloved by him. He sent them to fight against the infidels; and, by GOD's assistance, they were victorious.

THE son of BERKIA was called AFGH'AN, and the son of IRMIA was named USBEC. Those youths distinguished themselves in the reign of DAVID, and were employed by SOLOMON. AFGH'AN was distinguished

distinguished by his corporal strength, which struck terror into Demons and Genii. USBEK was eminent for his learning.

AFGH'AN used frequently to make excursions to the mountains; where his progeny, after his death, established themselves, lived in a state of independence, built forts, and exterminated the infidels.

WHEN the select of creatures, MUHAMMED, appeared upon earth, his fame reached the AFGH'ANS, who sought him in multitudes under their leaders KHALID and ABDUL RASHID, sons of WALID. The prophet honoured them with the most gracious reception, saying, "Come, O Mu-luc, or Kings:" whence they assumed the title of *Melic*, which they enjoy to this day. The prophet gave them his ensign, and said that the faith would be strengthened by them.

MANY sons were born of KHA'LID, the son of WALID, who signalized themselves in the presence of the prophet, by fighting against the infidels. MUHAMMED honoured and prayed for them.

IN the reign of Sultan MAHMUD of *Ghaznah*, eight men arrived, of the posterity of KHA'LID the son of WALID, whose names were KALUN, ALUN, DAUD, YALUA, AHMED, AWIN, and GHA'ZI'. The Sultan was much pleased with them, and appointed each a commander in his army. He also conferred on them the offices of *Vazir*, and *Vakili Mutlak*, or Regent of the Empire.

WHEREVER they were stationed they obtained possession of the country, built mosques, and overthrew the temples of idols. They increased

so much, that the army of MAHMU'D was chiefly composed of *Afghàns*. When HERHIND, a powerful prince of *Hinduстан*, meditated an invasion of *Ghaznah*, Sultan MAHMU'D dispatched against him the descendants of KHA'LID with twenty thousand horse: a battle ensued; the *Afghàns* made the attack; and, after a severe engagement, which lasted from day-break till noon, defeated HERHIND, killed many of the infidels, and converted some to the *Muhammedan* faith.

THE *Afghàns* now began to establish themselves in the mountains; and some settled in cities with the permission of Sultan MAHMU'D. They framed regulations, dividing themselves into four classes, agreeably to the following description. The first is the *pure* class, consisting of those whose fathers and mothers were *Afghàns*. The second class consists of those whose fathers were *Afghàns*, and mothers of another nation. The third class contains those whose mothers were *Afghàns*, and fathers of another nation. The fourth class is composed of the children of women whose mothers were *Afghàns*, and fathers and husbands of a different nation. Persons who do not belong to one of the classes, are not called *Afghàns*.

AFTER the death of Sultan MAHMU'D they made another settlement in the mountains. SHIHABUDDIN *Gauri*, a subsequent Sultan of *Ghaznah*, was twice repulsed from *Hinduстан*. His *Vazir* assembled the people, and asked if any of the posterity of KHA'LID were living. They answered, "Many now live in a state of independence in the mountains, where they have a considerable army." The *Vazir* requested them to go to the mountains, and by entreaties prevail on the *Afghàns* to come; for they were the descendants of companions of the prophet.

The inhabitants of *Ghuznah* undertook this embassy, and, by entreaties and presents, conciliated the minds of the *Afghans*, who promised to engage in the service of the Sultan, provided he would himself come, and enter into an agreement with them. The Sultan visited them in their mountains; honoured them; and gave them dresses and other presents. They supplied him with twelve thousand horse, and a considerable army of infantry. Being dispatched by the Sultan before his own army, they took *Dehli*, killed ROY PAHTOURA the King, his Ministers, and Nobles, laid waste the city, and made the infidels prisoners. They afterwards exhibited nearly the same scene in *Canauj*.

The Sultan, pleased by the reduction of those cities, conferred honours upon the *Afghans*. It is said, that he then gave them the titles of *Patàn* and *Khàn*: the word *Patàn* is derived from the *Hindi* verb *Patnà*, to rush, in allusion to their alacrity in attacking the enemy. The *Patàns* have greatly distinguished themselves in the history of *Hindustàn*, and are divided into a variety of sects.

The race of *Afghans* possessed themselves of the mountain of SOLOMON, which is near *Kandahar*, and the circumjacent country, where they have built forts: this tribe has furnished many kings. The following monarchs of this race have sat upon the throne of *Dehli*: Sultan *Behlolo*, *Afghàn LODI*, Sultan SECANDER, Sultan IBRA'HIM, SHI'R SHAH, ISLA'M SHAH, ADIL SHAH SUR. They also number the following kings of *Gaur*: SOLAIMAN *Shah Gurzani*, BAYAZID *Shah*, and KURT *Shah*; besides whom their nation has produced many conquerors of Provinces. The *Afghans* are called *Solaiminî*, either because they

were formerly the subjects of SOLOMON, king of the *Jews*, or because they inhabit the mountain, of SOLOMON.

THE translation being finished, I shall only add, that the country of the *Afgháns*, which is a province of *Cábul*, was originally called *Roh*, and from hence is derived the name of the *Rohillahs*. The city, which was established in it by the *Afgháns*, was called by them *Paishwer*, or *Paishör*, and is now the name of the whole district. The sects of the *Afgháns* or *Putáns* are very numerous. The principal are these: *Lodí*, *Lohani*, *Sür*, *Serwani*, *Yüsufzahi*, *Bangish*, *Dilazani*, *Khuttí*, *Yasin*, *Khail*, and *Babje*. The meaning of *Zahí*, is offspring, and of *Khail*, sect. A very particular account of the *Afgháns*, has been written by the late HA'FIZ RAHMAT *Khán*, a chief of the *Rohillahs*, from which the curious reader may derive much information. They are *Muselmans*, partly of the *Sumí*, and partly of the *Shiah*, persuasion. They are great boasters of the antiquity of their origin, and reputation of their tribe, but other *Muselmans* entirely reject their claim, and consider them of modern, and even base, extraction. However, their character may be collected from history. They have distinguished themselves by their courage, both singly and unitedly, as principals and auxiliaries. They have conquered for their own princes and for foreigners, and have always been considered the main strength of the army, in which they have served. As they have been applauded for virtues, they have also been reproached for vices, having sometimes been guilty of treachery, and even acted the base part of assassins.

A SPECIMEN OF THE PUSHTO LANGUAGE.

لِسْتَمَ ظَا لِهَانُ حَا كِهَانُ  
اَوْرُكُورِ پِشُورِ دِرِي وَ اَرَه يُو دِي

By the oppression of tyrannical rulers,  
Fire, the grave, and *Paishôr*, all three have been rendered equal.

دُسْتَت و پَرِ خَصَّة دِي رَا غَلِي رَوَا بَت

With respect to prayers enjoined by the *Sunnah*, they are remitted.  
It is thus expressed in the reports.

نَاي اَو كَا دِيرَه شِدُوِي كَا ي نَكِه هِيسُ پَرِي نُوِي

If a *man* perform them, it is very laudable. If he do not perform them it  
is no crime in him.

مِرزا خان  
اَب مِرزا كَه د خُوِي بَهْتَرِي بُوِي  
د سَيِّد نَغَا وَ ب سِه دِي لَه بَا مَنَه

If the disposition be not good, O *Mirzá*,  
What difference is there between a *Sayyed* and a *Brahman*?

## NOTE BY THE PRESIDENT.

THIS account of the *Afgháns* may lead to a very interesting discovery. We learn from *ESDRAS*, that the Ten Tribes, after a wandering journey, came to a country called *Arfareth* ; where, we may suppose, they settled : now the *Afgháns* are said by the best *Persian* historians to be descended from the *Jerus* ; they have traditions among themselves of such a descent ; and it is even asserted, that their families are distinguished by the names of *Jerwish* tribes, although, since their conversion to the *Islám*, they studiously conceal their origin ; the *Pushto* language, of which I have seen a dictionary, has a manifest resemblance to the *Chaldaick* ; and a considerable district under their dominion is called *Hazáreh*, or *Hazáret*, which might easily have been changed into the word used by *ESDRAS*. I strongly recommend an inquiry into the literature and history of the *Afgháns*.

## V.

REMARKS ON THE ISLAND OF HINZUAN OR JOHANNA  
BY THE PRESIDENT.

**H**INZU'AN (a name, which has been gradually corrupted into *Anzuane*, *Anzuan*, *Juanmy*, and *Johanna*) has been governed about two centuries by a colony of *Arabs*, and exhibits a curious instance of the slow approaches toward civilization, which are made by a small community, with many natural advantages, but with few means of improving them. An account of this *African* island, in which we hear the language and see the manners of *Arabia*, may neither be uninteresting, in itself, nor foreign to the objects of inquiry proposed at the institution of our Society.

On *Monday* the 28th of *July* 1783, after a voyage, in the *Crocodile*, of ten weeks and two days from the rugged islands of *Cape Verd*, our eyes were delighted with a prospect so beautiful, that neither a painter nor a poet could perfectly represent it, and so cheering to us, that it can justly be conceived by such only, as have been in our preceding situation. It was the fun rising in full splendour on the isle of *Mayáta* (as the seaman called it) which we had joyfully distinguished the preceding afternoon by the height of its peak, and which now appeared at no great distance from the windows of our cabin; while *Hinzúán*, for which we had so long panted, was plainly discernible a-head, where its high lands presented themselves with remarkable boldness. The weather was fair; the water, smooth; and a gentle breeze drove us easily before dinner time round a rock, on which the *Brilliant* struck just a



before, into a commodious road \*, where were we dropped our anchor early in the evening : we had seen *Mohila*, another sister island, in the course of the day.

THE frigate was presently surrounded with canoes, and the deck soon crowded with natives of all ranks, from the high-born chief, who washed linen, to the half-naked slave, who only paddled. Most of them had letters of recommendation from *Englishmen*, which none of them were able to read, though they spoke *English* intelligibly ; and some appeared vain of titles, which our countrymen had given them in play, according to their supposed stations : we had *Lords*, *Dukes*, and *Princes* on board soliciting our custom and importuning us for presents. In fact they were too sensible to be proud of empty sounds, but justly imagined, that those ridiculous titles would serve as marks of distinction, and, by attracting notice, procure for them something substantial. The only men of real consequence in the island, whom we saw before we landed, were the Governor ABULLAH, second cousin to the king, and his brother ALWI', with their several sons ; all of whom will again be particularly mentioned : they understood *Arabick*, seemed zealots in the *Mohammedan* faith, and admired my copies of the *Alkoran* ; some verses of which they read, whilst ALWI' perused the opening of another *Arabian* manuscript, and explained it in *English* more accurately than could have been expected.

The next morning showed us the island in all its beauty ; and the scene

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\* Lat  $12^{\circ} 16' 47''$  S. Long  $44^{\circ} 25' 5''$  E. by the Master.

was so diversified, that a distinct view of it could hardly have been exhibited by the best pencil: you must, therefore, be satisfied with a mere description, written on the very spot and compared attentively with the natural landscape. We were at anchor in a fine bay, and before us was a vast amphitheatre, of which you may form a general notion by picturing in your minds a multitude of hills infinitely varied in size and figure, and then supposing them to be thrown together, with a kind of artless symmetry, in all imaginable positions. The back ground was a series of mountains, one of which is pointed, near half a mile perpendicularly high from the level of the sea, and little more than three miles from the shore: all of them were richly clothed with wood, chiefly fruit-trees, of an exquisite verdure. I had seen many a mountain of a stupendous height in *Wales* and *Switzerland*, but never saw one before, round the bosom of which the clouds were almost continually rolling, while its green summit rose flourishing above them, and received from them an additional brightness. Next to this distant range of hills was another tier, part of which appeared charmingly verdant, and part rather barren; but the contrast of colours changed even this nakedness into a beauty: nearer still were innumerable mountains, or rather cliffs, which brought down their verdure and fertility quite to the beach; so that every shade of green, the sweetest of colours, was displayed at one view by land and by water. But nothing conduced more to the variety of this enchanting prospect, than the many rows of palm trees, especially the tall and gracefully *Arca's*, on the shores, in the valleys, and on the ridges of hills where one might almost suppose them to have been planted regularly by design. A more beautiful appearance can scarce be conceived, than such a number of elegant palms in such a situation, with luxuriant tops like verdant plumes, placed at just intervals, and showing between them

part of the remoter landscape, while they left the rest to be supplied by the beholder's imagination. The town of *Matfamúdd* lay on our left, remarkable at a distance for the tower of the principal mosque, which was built by **HALI'-MAH**, a queen of the island, from whom the present king is descended; a little on our right was a small town, called *Bantáni*. Neither the territory of *Nice*, with its olives, date-trees, and cypresses, not the isles of *Hieres*, with their delightful orange-groves, appeared so charming to me, as the view from the road of *Hinzáún*; which, nevertheless, is far surpassed, as the Captain of the *Crocodile* assured us, by many of the islands in the southern ocean. If life were not too short for the complete discharge of all respective duties, publick and private, and for the acquisition even of necessary knowledge in any degree of perfection, with how much pleasure and improvement might a great part of it be spent in admiring the beauties of this wonderful orb, and contemplating the nature of man in all its varieties!

WE hastened to tread on firm land, to which we had been so long disused, and went on shore after breakfast, to see the town, and return the Governor's visit. As we walked, attended by a crowd of natives, I surprized them by reading aloud an *Arabic* inscription over the gate of a mosque, and still more, when I entered it, by explaining four sentences, which were written very distinctly on the wall, signifying, "that the world was given us for our own edification, not for the purpose of raising sumptuous buildings; life, for the discharge of moral and religious duties, not for pleasurable indulgences; wealth, to be liberally bestowed, not avariciously hoarded; and learning, to produce good actions, not empty disputes." We could not but respect the temple even of a false prophet, in which we found such excellent morality: we saw nothing

better among the *Romish* trumpery in the church at *Madeira*. When we came to ABDULLAH's house, we were conducted through a small court-yard into an open room, on each side of which was a large and convenient sofa, and above it a high bed-place in a dark recess, over which a chintz counterpoint hung down from the ceiling. This is the general form of the best rooms in the island; and most of the tolerable houses have a similar apartment on the opposite side of the court, that there may be at all hours a place in the shade for dinner or for repose. We were entertained with ripe dates from *Yemen*, and the milk of coconuts; but the heat of the room, which seemed accessible to all who chose to enter it, and the scent of musk or civet, with which it was perfumed, soon made us desirous of breathing a purer air; nor could I be detained long by the *Arabic* manuscripts which the Governor produced, but which appeared of little use, and consequently of no value except to such as love mere curiosities. One of them, indeed, relating to the penal law of the *Mohammedans*, I would gladly have purchased at a just price; but he knew not what to ask, and I knew that better books on that subject might be procured in *Bengal*. He then offered me a black boy for one of my *Alkorans*, and pressed me to barter an *Indian* dress, which he had seen on board the ship, for a cow and calf: the golden slippers attracted him most, since his wife, he said, would like to wear them; and, for that reason, I made him a present of them; but had destined the book and the robe for his superior. No high opinion could be formed of *Sayyad* ABDULLA, who seemed very eager for gain, and very servile where he expected it.

OUR next visit was to *Shaikh* SALIM, the king's eldest son; and, if we had seen him first, the state of civilization in *Hinzuan* would have appeared

peared at its lowest ebb. The worst *English* hackney in the worst stable, is better lodged, and looks more princely than this heir apparent; but, though his mien and apparel were extremely savage, yet allowance should have been made for his illness; which, as we afterwards learned, was an abscess in the spleen, a disorder not uncommon in that country, and frequently cured, agreeably to the *Arabian* practice, by the actual cautery. He was incessantly chewing pieces of the *Areca-nut* with shell-lime: a custom borrowed, I suppose, from the *Indians*, who greatly improve the composition with spices and betel-leaves, to which they formerly added camphor: all the natives of rank chewed it, but not, I think, to so great an excess. Prince SA'LIM from time to time gazed at himself with complacency in a piece of broken looking-glass, which was glued on a small board; a specimen of wretchedness which we observed in no other house; but many circumstances convinced us, that the apparently low condition of his royal highness, who was not on bad terms with his father, and seemed not to want authority, proceeded wholly from his avarice. His brother HAMDULLAH, who generally resides in the town of *Domon*, has a very different character, being esteemed a man of worth, good sense, and learning: he had come, the day before, to *Matfamido*, on hearing that an *English* frigate was in the road; and I, having gone out for a few minutes to read an *Arabic* inscription, found him, on my return, devouring a manuscript which I had left with some of the company. He is a *Kadi*, or *Mohammedan* judge; and, as he seemed to have more knowledge than his countrymen, I was extremely concerned that I had so little conversation with him. The king, *Shaikh* AHMED, has a younger son, named ABDULLAH, whose usual residence is in the town of *Wani*, which he seldom leaves, as the state of his health is very infirm. Since the succession to the title and authority of *Sultàn* is not unalterably fixed in one line,

but

but requires confirmation by the chiefs of the island, it is not improbable that they may hereafter be conferred on prince HAMDULLAH.

A LITTLE beyond the hole in which SA'LIM received us, was his *haram*, or the apartment of his women, which he permitted us all to see; not through politeness to strangers, as we believed at first, but, as I learned afterwards from his own lips, in expectation of a present. We saw only two or three miserable creatures with their heads covered, while the favourite, as we supposed, stood behind a coarse curtain, and showed her ankles under it, loaded with silver rings; which, if she was capable of reflection, she must have considered as glittering fetters rather than ornaments; for a rational being would have preferred the condition of a wild beast, exposed to perils and hunger in a forest, to the splendid misery of being wife or mistress to SA'LIM.

BEFORE we returned, ALWI' was desirous of showing me his books; but the day was too far advanced, and I promised to visit him some other morning. The governor, however, prevailed on us to see his place in the country, where he invited us to dine the next day: the walk was extremely pleasant from the town to the side of a rivulet, which formed in one part a small pool, very convenient for bathing, and thence through groves and alleys, to the foot of a hill; but the dining-room was little better than an open barn, and was recommended only by the coolness of its shade. ABDULLAH would accompany us on our return to the ship, together with two *Muftis*, who spoke *Arabic* indifferently, and seemed eager to see all my manuscripts; but they were very moderately learned, and gazed with stupid wonder on a fine copy of the *Hamásah*, and on other collections of ancient poetry.

EARLY the next morning a black messenger, with a tawny lad as his interpreter, came from Prince SA'LIM; who, having broken his perspective-glass, wished to procure another by purchase or barter: a polite answer was returned, and steps taken to gratify his wishes. As we on our part expressed a desire to visit the king at *Domóni*, the prince's messenger told us that his master would, no doubt, lend us palanquins (for there was not a horse in the island) and order a sufficient number of his vassals to carry us, whom we might pay for their trouble, as we thought just: we commissioned him, therefore, to ask that favour, and begged that all might be ready for our excursion before sun-rise, that we might escape the heat of the noon, which, though it was the middle of winter, we had found excessive. The boy, whose name was COMBO MADU, staid with us longer than his companion: there was something in his look so ingenuous, and in his broken *English* so simple, that we encouraged him to continue his innocent prattle. He wrote and read *Arabic* tolerably well, and set down at my desire the names of several towns in the island, which, he first told me, was properly called *Hinzún*. The fault of begging for whatever he liked he had in common with the governor and other nobles; but hardly in a greater degree. His first petition for some lavender-water was readily granted; and a small bottle of it was so acceptable to him, that, if we had suffered him, he would have kissed our feet; but it was not for himself that he rejoiced so extravagantly: he told us, with tears starting from his eyes, that his mother would be pleased with it, and the idea of her pleasure seemed to fill him with rapture: never did I see filial affection more warmly felt, or more tenderly and, in my opinion, unaffectedly expressed; yet this boy was not a favourite of the officers, who thought him artful. His mother's name, he said, was FA'TIMA; and he importuned us to visit her;

her; conceiving, I suppose, that all mankind must love and admire her. We promised to gratify him; and, having made him several presents, permitted him to return. As he reminded me of ALADDIN in the *Arabian* tale, I designed to give him that name in a recommendatory letter, which he pressed me to write, instead of St. DOMINGO, as some *European* visiter had ridiculously called him; but, since the allusion would not have been generally known, and since the title of *Alâu'dîn*, or *Eminence in Faith*, might have offended his superiors, I thought it advisable for him to keep his *African* name. A very indifferent dinner was prepared for us at the house of the Governor, whom we did not see the whole day, as it was the beginning of *Ramadân*, the *Mohammedan* lent, and he was engaged in his devotions, or made them his excuse; but his eldest son sat by us while we dined, together with MU'SA, who was employed, jointly with his brother HUSAIN, as purveyor to the Captain of the frigate.

HAVING observed a very elegant shrub, that grew about six feet high in the court-yard, but was not then in flower, I learned with pleasure that it was *Hinnâ*, of which I had read so much in *Arabian* poems, and which *European* botanists have ridiculously named *Larxonia*. MU'SA bruised some of the leaves, and having moistened them with water, applied them to our nails and the tips of our fingers, which, in a short time, became of a dark orange-scarlet. I had before conceived a different idea of this dye, and imagined that it was used by the *Arabs* to imitate the natural redness of those parts in young and healthy persons, which in all countries must be considered as a beauty: perhaps a less quantity of *Hinnâ*, or the same differently prepared, might have produced that effect. The old men in *Arabia* used the same dye to conceal their grey hairs, while their daughters



were dying their lips and gums black, to set off the whiteness of their teeth ; so universal in all nations and ages are personal vanity, and a love of disguising truth ; though in all cases, the farther our species recede from nature, the farther they depart from true beauty ; and men at least should disdain to use artifice or deceit for any purpose, or on any occasion. If the women of rank at *Paris*, or those in *London*, who wish to imitate them, be inclined to call the *Arabs* barbarians, let them view their own head-dresses and cheeks in a glass, and, if they have left no room for blushes, be inwardly at least ashamed of their censure.

In the afternoon I walked a long way up the mountains in a winding path, amid plants and trees, no less new than beautiful, and regretted exceedingly that very few of them were in blossom ; as I should then have had leisure to examine them. Curiosity led me from hill to hill ; and I came at last to the sources of a rivulet, which we had passed near the shore, and from which the ship was to be supplied with excellent water. I saw no birds on the mountains but *Guinea-fowls*, which might have been easily caught : no insects were troublesome to me but mosquitos ; and I had no fear of venomous reptiles, having been assured that the air was too pure for any to exist in it ; but I was often unwillingly a cause of fear to the gentle and harmless lizard, who ran among the shrubs. On my return I missed the path by which I had ascended ; but having met some blacks laden with yams and plantains, I was by them directed to another which led me round, through a charming grove of cocoa-trees, to the Governor's country-seat, where our entertainment was closed by a syllabub, which the *English* had taught the *Muslimans* to make for them.

WE received no answer from SA'LIM, nor, indeed, expected one; since we took for granted that he could not but approve our intention of visiting his father; and we went on shore before sunrise, in full expectation of a pleasant excursion to *Domóni*: but we were happily disappointed. The servants at the prince's door, told us coolly that their master was indisposed, and, as they believed, asleep; that he had given them no orders concerning his palanquins, and that they durst not disturb him. ALWI' soon came to pay us his compliments, and was followed by his eldest son, AHMED, with whom we walked to the gardens of the two princes, SA'LIM and HAMBULLAH; the situation was naturally good, but wild and desolate; and, in SA'LIM's garden, which we entered through a miserable hovel, we saw a convenient bathing-place, well-built with stone, but then in great disorder, and a shed, by way of summer-house, like that under which we dined at the governor's, but smaller, and less neat. On the ground lay a kind of cradle about six feet long, and little more than one foot in breadth, made of cords twisted in a sort of clumsy net-work, with a long thick bamboo axed to each side of it. This, we heard with surprise, was a royal palanquin, and one of the vehicles in which we were to have been rocked on mens shoulders over the mountains. I had much conversation with AHMED, whom I found intelligent and communicative. He told me that several of his countrymen composed songs and tunes; that he was himself a passionate lover of poetry and music; and that, if we would dine at his house, he would play and sing to us. We declined his invitation to dinner, as we had made a conditional promise, if ever we passed a day at *Matsamkalo*, to eat our curry with *Banà GIBU*, an honest man, of whom we purchased eggs and vegetables, and to whom some *Englishman* had given the title of *Lord*, which made him extremely vain: we could, therefore, make

*Sayyad* AHMED only a morning visit. He sung a hymn or two in *Arabic*, and accompanied his drawling, though pathetic psalmody, with a kind of mandoline, which he touched with an aukward quill: the instrument was very imperfect, but seemed to give him delight. The names of the strings were written on it in *Arabian* or *Indian* figures, simple and compounded; but I could not think them worth copying. He gave Captain WILLIAMSON, who wished to present some literary curiosities to the library at *Dublin*, a small roll, containing a hymn in *Arabic* letters, but in the language of *Mombaza*, which was mixed with *Arabic*; but it hardly deserved examination, since the study of languages has little intrinsic value, and is only useful as the instrument of real knowledge, which we can scarce expect from the poets of the *Mozambique*. AHMED would, I believe, have heard our *European* airs (I always except *French* melody) with rapture; for his favourite tune was a common *Irish* jig, with which he seemed wonderfully affected.

ON our return to the beach I thought of visiting old ALWI', according to my promise, and prince SALI'M, whose character I had not then discovered: I resolved for that purpose to stay on shore alone, our dinner with GIBU having been fixed at an early hour. ALWI' showed me his manuscripts, which chiefly related to the ceremonies and ordinances of his own religion; and one of them, which I had formerly seen in *Europe*, was a collection of sublime and elegant hymns in praise of MOHAMMED, with explanatory notes in the margin. I requested him to read one of them after the manner of the *Arabs*, and he chanted it in a strain by no means unpleasing; but I am persuaded that he understood it very imperfectly. The room, which was open to the street, was presently crowded with visitors, most of whom were *Mustis*, or *Expounders of the Law*; and ALWI', desirous

desirous perhaps to display his zeal before them at the expence of good breeding, directed my attention to a passage in a commentary on the *Koràn*, which I found levelled at the *Christians*. The commentator, having related with some additions (but, on the whole, not inaccurately) the circumstances of the temptation, puts this speech into the mouth of the tempter: “ though I am unable to delude thee, yet I will mislead, “ by thy means, more human creatures than thou wilt set right.” ‘ Nor ‘ was this menace vain,’ says the *Mohammedan* writer, ‘ for the inhabitant. ‘ of a region many thousand leagues in extent, are still so deluded by ‘ the Devil, that they impiously call I’sA the son of GOD. Heaven pre- ‘ serve us,’ he adds, ‘ from blaspheming *Christians* as well as blaspheming ‘ *Jews*.’ Although a religious dispute with those obstinate zealots would have been unreasonable and fruitless, yet they deserved, I thought, a slight reprehension, as the attack seemed to be concerted among them. ‘ The ‘ commentator,’ said I, ‘ was much to blame for passing so indiscriminate ‘ and hasty a censure: the title which gave your legislator, and given ‘ you such offence, was often applied in *Judea* by a bold figure, agree- ‘ able to the *Hebrew* idiom, though unusual in *Arabic*, to *angels*, to *holy ‘ men*, and even to *all mankind*, who are commanded to call GOD *their ‘ Father*; and in this large sense the Apostle to the *Romans* calls the ‘ elect the *children of GOD*, and the MESSIAH the *first-born among many ‘ brethren*; but the words *only begotten* are applied transcendently and in- ‘ comparably to him alone \*; and as for me, who believe the scriptures, ‘ which you also profess to believe, though you assert without proof that we ‘ have altered them, I cannot refuse him an appellation, though far surpass- ‘ ing our reason, by which he is distinguished in the Gospel; and the be-

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\* Rom. viii. 29. See 1 John iii. 1. II. Barrow, 231, 232, 251.

‘ lievers in MUHAMMED, who exprefsly name him *the Meffiah*, and pronounce him to have been born of a virgin, which alone might fully juftify the phrafe condemned by this author, are themfelves condemnable for cavilling at words, when they cannot object to the fubftance of our faith confiftently with their own.’ The *Mufelmans* had nothing to fay in reply; and the converfation was changed.

I WAS aftonifhed at the queftions which ALWI’ put to me concerning the late peace and the independence of *America*; the feveral powers and refources of *Britain* and *France*, *Spain* and *Holland*; the character and fupposed views of the Emperor; the comparative ftrength of the *Ruffian*, Imperial, and *Othman* armies, and their refpective modes of bringing their forces to action. I answered him without referve, except on the ftate of our poffeffions in *India*; nor were my answers loft, for I obferved, that all the company were variously affected by them; generally with amazement, often with concern; efpecially when I defcribed to them the great force and admirable difcipline of the *Auftrian* army, and the ftupid prejudices of the *Turks*, whom nothing can induce to abandon their old *Tartarian* habits; and expofed the weaknefs of their empire in *Africa*, and even in the more diftant provinces of *Afia*. In return, he gave me clear, but general, information concerning the government and commerce of his ifland. “His country,” he faid, “was poor, and produced few articles of trade; but, if they could get money, *which they now preferred to play-things* (thofe were his words) they might eafily,” he added, “procure foreign commodities, and exchange them advantageoufly with their neighbours in the iflands and on the continent. Thus with a little money,” faid he, “we purchafe mufkets, powder, balls, cutlafles, knives, cloths, raw cotton, and other articles brought from *Bombay*; and with  
“ thofe

“ those we trade to *Madagascar* for the natural produce of the country, or  
 “ for *dollars*, with which the *French* buy cattle, honey, butter, and so forth,  
 “ in that island. With *gold*, which we receive from your ships, we can  
 “ procure elephants teeth from the natives of *Mozambique*, who barter  
 “ them also for ammunition and bars of iron; and the *Portuguese* in that  
 “ country give us cloths of various kinds in exchange for our commodities:  
 “ those cloths we dispose of lucratively in the three neighbouring islands;  
 “ whence we bring rice, cattle, a kind of bread-fruit which grows in  
 “ *Comara*, and *slaves*, which we buy also at other places to which we trade;  
 “ and we carry on this traffic in our own vessels.”

HERE I could not help expressing my abhorrence of their *slave-trade*, and asked him by what law they claimed a property in rational beings, since our Creator had given our species a dominion, to be moderately exercised, over the beasts of the field and the fowls of the air, but none to man over man? “ By no law,” answered he, “ unless necessity be a law. “ There are nations in *Madagascar* and in *Asia*, who know neither  
 “ GOD, nor his Prophet, nor MOSES, nor DAVID, nor the MESSIAH:  
 “ those nations are in perpetual war, and take many captives, whom, if  
 “ they could not sell, they would certainly kill. Individuals among  
 “ them are in extreme poverty, and have numbers of children, who,  
 “ if they cannot be disposed of, must perish through hunger, together  
 “ with their miserable parents. By purchasing these wretches, we pre-  
 “ serve their lives, and, perhaps, those of many others whom our  
 “ money relieves. The sum of the argument is this: If we buy them,  
 “ they will live; if they become valuable servants, they will live com-  
 “ fortably; but if they are not sold, they must die miserably.” “ There  
 “ may be,” said I, “ such cases; but you fallaciously draw a general con-

' clusion from a few particular instances; and this is the very fallacy  
 ' which, on a thousand other occasions, deludes mankind. It is not to be  
 ' doubted that a constant and gainful traffic in human creatures foment  
 ' war, in which captives are always made, and keeps up that perpetual en-  
 ' mity, which you pretend to be the *cause* of a practice in itself repreh-  
 ' sible, while in truth it is its *effect*; the same traffic encourages laziness in  
 ' some parents, who might in general support their families by proper in-  
 ' dustry, and seduces others to stifle their natural feelings. At most, your  
 ' redemption of those unhappy children can amount only to a personal  
 ' contract, implied between you, for gratitude and reasonable service on  
 ' their part, for kindness and humanity on yours; but can you think  
 ' your part performed by disposing of them against their wills with as  
 ' much indifference as if you were selling cattle; especially as they  
 ' might become readers of the *Korán*, and pillars of your faith? The  
 ' law,' said he, ' forbids our selling them when they are believers in the  
 ' Prophet; and little children only are sold; nor they often, or by all  
 ' masters.' " You, who believe in MUHAMMED," said I, " are bound by  
 " the spirit and letter of his laws to take pains, that they also may believe  
 " in him; and, if you neglect so important a duty for sordid gain, I do  
 " not see how you can hope for prosperity in this world, or for happiness  
 " in the next." My old friend and the *Muftis* assented, and muttered a  
 few prayers; but probably forgot my preaching before many minutes had  
 passed.

So much time had slipped away in this conversation, that I could  
*make but a short visit* to Prince SA'LIM; and my view in visiting him  
 was to fix the time of our journey to *Domóni* as early as possible on  
 the next morning. His appearance was more savage than ever; and I  
 found

found him in a disposition to complain bitterly of the *English*. “No acknowledgement,” he said, “had been made for the kind attentions of himself and the chief men in his country to the officers and people of the *Brilliant*, though a whole year had elapsed since the wreck.” I really wondered at the forgetfulness, to which alone such a neglect could be imputed, and assured him, that I would express my opinion both in *Bengal* and in letters to *England*. “We have little,” said he, “to hope from letters; for, when we have been paid with them instead of money, and have shown them on board your ships, we have commonly been treated with disdain, and often with imprecations.” I assured him that either those letters must have been written coldly and by very obscure persons, or shown to very ill-bred men, of whom there were too many in all nations; but that a few instances of rudeness ought not to give him a general prejudice against our national character. “But you,” said he, “are a wealthy nation; and we are indigent: yet, though all our groves of cocoa-trees, our fruits, and our cattle, are ever at your service, you always try to make hard bargains with us for what you chuse to dispose of, and frequently will neither sell nor give those things which we principally want.” ‘To form,’ said I, ‘a just opinion of *Englishmen*, you must visit us in our own island, or at least in *India*; here we are strangers and travellers: many of us have no design to trade in any country, and none of us think of trading in *Hinzuan*, where we stop only for refreshment. The clothes, arms, or instruments, which you may want, are commonly necessary or convenient to us; but, if *Sayyad Alwi* or his sons were to be strangers in our country, you would have no reason to boast of superior hospitality.’ He then showed me, a second time, a part of an old silk vest with the star of the order of the Thistle, and begged me to explain the motto; expressing a  
with



with that the order might be conferred on him by the King of *England*, in return for his good offices to the *English*. I represented to him the impossibility of his being gratified, and took occasion to say, that there was more true dignity in their own native titles than in those of *Prince*, *Duke*, and *Lord*, which had been idly given them, but had no conformity to their manners, or the constitution of their government.

THIS conversation not being agreeable to either of us, I changed it, by desiring that the palanquins and bearers might be ready next morning as early as possible. He answered, that his palanquins were ~~at~~ our service for nothing, but that we must pay him ten dollars for each set of bearers; that it was the stated price; and that Mr. HASTINGS had paid it when he went to visit the king. This, as I learned afterwards, was false; but, in all events, I knew that he would keep the dollars himself, and give nothing to the bearers, who deserved them better, and whom he would compel to leave their cottages and toil for his profit. "Can you imagine," I replied, "that we would employ four-and-twenty men to bear us so far on their shoulders without rewarding them amply? But since they are free men (so he had assured me) and not your slaves, we will pay them in proportion to their diligence and good behaviour; and it becomes neither your dignity nor ours to make a previous bargain." I showed him an elegant copy of the *Koràn*, which I destined for his father, and described the rest of my present; but he coldly asked, "if that was all." Had he been king, a purse of dry dollars would have given him more pleasure than the finest or holiest manuscript. Finding him, in conversing on a variety of subjects, utterly void of intelligence or principle, I took my leave, and saw him no more; but promised to let him know for certain whether we should make our intended excursion.

WE dined in tolerable comfort, and had occasion, in the course of the day, to observe the manners of the natives in the middle rank, who are called *Bánas*, and all of whom have slaves constantly at work for them. We visited the mother of COMBOMA'DI, who seemed in a station but little raised above indigence; and her husband, who was a mariner, bartered an *Arabic* treatise on astronomy and navigation, which he had read, for a sea-compass, of which he well knew the use.

IN the morning I had conversed with two very old *Arabs* of *Yemen*, who had brought some articles of trade to *Hinzuan*; and in the afternoon I met another, who had come from *Mafkat* (where at that time there was a civil war) to purchase, if he could, an hundred stand of arms. I told them all that I loved their nation; and they returned my compliments with great warmth, especially the two old men, who were near fourscore; and reminded me of ZOHAIK and HA'RETH.

So bad an account had been given me of the road over the mountains, that I dissuaded my companions from thinking of the journey, to which the Captain became rather disinclined; but, as I wished to be fully acquainted with a country which I might never see again, I wrote the next day to SA'LIM, requesting him to lend me one palanquin, and to order a sufficient number of men. He sent me no written answer; which I ascribe rather to his incapacity than to rudeness: but the Governor, with ALWI' and two of his sons, came on board in the evening, and said, that they had seen my letter; that all should be ready; but that I could not pay less for the men than ten dollars. I said I would pay more; but it should be to the men themselves, according to their behaviour. They returned somewhat dissatisfied, after I had played at chess with ALWI's

younger son, in whose manner and address there was something remarkably pleasing.

BEFORE sunrise on the 2d of *August*, I went alone on shore, with a small basket of such provisions as I might want in the course of the day, and with some cushions to make the prince's palanquin at least a tolerable vehicle; but the prince was resolved to receive the dollars to which his men were entitled; and he knew that, as I was eager for the journey, he could prescribe his own terms. Old ALWI' met me on the beach, and brought excuses from SA'LIM, who, he said, was indisposed. He conducted me to his house, and seemed rather desirous of persuading me to abandon my design of visiting the king; but I assured him, that if the prince would not supply me with proper attendants, I would walk to *Damoni* with my own servants and a guide. *Shaukh* SA'LIM, he said, was miserably avaricious; that he was ashamed of a kinsman with such a disposition; but that he was no less obstinate than covetous; and that without ten dollars paid in hand, it would be impossible to procure bearers. I then gave him three guineas, which he carried, or pretended to carry to SA'LIM, but returned without the change, alleging that he had no silver, and promising to give me, on my return, the few dollars that remained. In about an hour the ridiculous vehicle was brought by nine sturdy blacks, who could not speak a word of *Arabic*; so that I expected no information concerning the country through which I was to travel; but ALWI' assisted me in a point of the utmost consequence. 'You cannot go,' said he, 'without an interpreter; for the king speaks only the language of this island; but I have a servant, whose name is TUMU'NI, a sensible and worthy man, who understands *English*, and is much esteemed by the king: he is known and valued all over  
 ' the

‘ *Hinzuan*. This man shall attend you, and you will soon be sensible of his worth.’

TUMU’NI desired to carry my basket; and we set out with a prospect of fine weather, but some hours later than I had intended. I walked by the gardens of the two princes to the skirts of the town, and came to a little village, consisting of several very neat huts, made chiefly with the leaves of the cocoa-tree; but the road a little farther was so stony, that I sat in the palanquin, and was borne with perfect safety over some rocks. I then desired my guide to assure the men that I would pay them liberally; but the poor peasants, who had been brought from their farms on the hills, were not perfectly acquainted with the use of money, and treated my promise with indifference.

ABOUT five miles from *Matamudo* lies the town of *Wani*, where *Shakh Abdullah*, who has already been mentioned, usually resides. I saw it at a distance, and it seemed to be agreeably situated. When I had passed the rocky part of the road I came to a stony beach, where the sea appeared to have lost some ground, since there was a fine sand to the left, and beyond it a beautiful bay, which resembled that of *Weymouth*, and seemed equally convenient for bathing; but it did not appear to me that the stones over which I was carried had been recently covered with water. Here I saw the frigate; and, taking leave of it for two days, turned from the coast into a fine country very neatly cultivated, consisting partly of hillocks exquisitely green, and partly of plains, which were then in a gaudy dress of rich yellow blossoms. My guide informed me that they were plantations of a kind of vetch, which was eaten by the natives. Cottages and farms were interspersed all over this gay cham-

paign, and the whole scene was delightful ; but it was soon changed for beauties of a different sort. We descended into a cool valley, through which ran a rivulet of perfectly clear water ; and there, finding my vehicle uneasy, though from the laughter and merriment of my bearers I concluded them to be quite at their ease, I bade them set me down, and walked before them all the rest of the way. Mountains, clothed with fine trees and flowering shrubs, presented themselves on our ascent from the vale ; and we proceeded for half an hour through pleasant wood-walks, where I regretted the impossibility of loitering a while to examine the variety of new blossoms which succeeded one another at every step, and the virtues, as well as names of which, seemed familiar to TUMU'NI. At length we descended into a valley of greater extent than the former : a river, or large wintry torrent, ran through it, and fell down a steep declivity at the end of it, where it seemed to be lost among rocks. Cattle were grazing on the banks of the river, and the huts of their owners appeared on the hills. A more agreeable spot I had not before seen, even in *Switzerland* or *Merionethshire* ; but it was followed by an assemblage of natural beauties which I hardly expected to find in a little island twelve degrees to the south of the *Line*. I was not sufficiently pleased with my solitary journey to discover charms which had no actual existence, and the first effect of the contrast between *St. Jago* and *Himzuàn* had ceased ; but, without any disposition to give the landscape a high colouring, I may truly say, what I thought at the time, that the whole country which next presented itself, as far surpassed *Emeroville* or *Blenheim*, or any other imitations of nature which I had seen in *France* or *England*, as the finest bay surpasses an artificial piece of water. Two very high mountains, covered to the summit with the richest verdure, were at some distance on my right hand, and separated from me by meadows

dows diversified with cottages and herds, or by vallies resounding with torrents and water-falls: on my left was the sea, to which there were beautiful openings from the hills and woods; and the road was a smooth path naturally winding through a forest of spicy shrubs, fruit-trees, and palms. Some high trees were spangled with white blossoms, equal in fragrance to orange-flowers. My guide called them *Monongos*, but the day was declining so fast, that it was impossible to examine them. The variety of fruits, flowers, and birds, of which I had a transient view in this magnificent garden, would have supplied a naturalist with amusement for a month; but I saw no remarkable insect, and no reptile of any kind. The woodland was diversified by a few pleasant glades, and new prospects were continually opened: at length a noble view of the sea burst upon me unexpectedly; and, having passed a hill or two, we came to the beach, beyond which were several hills and cottages. We turned from the shore, and on the next eminence I saw the town of *Domóni*, at a little distance below us. I was met by a number of natives, a few of whom spoke *Arabic*; and thinking it a convenient place for repose, I sent my guide to apprize the king of my intended visit. He returned in half an hour with a polite message, and I walked into the town, which seemed large and populous. A great crowd accompanied me; and I was conducted to a house built on the same plan with the best houses at *Matamudo*. In the middle of the court yard stood a large *Monongo*-tree, which perfumed the air; the apartment on the left was empty; and in that on the right sat the king, on a sofa or bench covered with an ordinary carpet. He rose when I entered, and, grasping my hands, placed me near him on the right; but, as he could speak only the language of *Hinzuan*, I had recourse to my friend TUMU'NI, than whom a readier or more accurate interpreter could not have been found. I

presented the king with a very handsome *Indian* dress of blue silk with golden flowers, which had been worn only once at a masquerade, and with a beautiful copy of the *Korân*, from which I read a few verses to him. He took them with great complacency, and said he wished I had come by sea, that he might have loaded one of my boats with fruit, and with some of his finest cattle. He had seen me, he said, on board the frigate, where he had been, according to his custom, in disguise, and had heard of me from his son *Shaikh* HAMDULLAH. I gave him an account of my journey, and extolled the beauties of his country: he put many questions concerning mine, and professed great regard for our nation. “But I hear,” said he, “that you are a magistrate, and consequently profess peace: why are you armed with a broadsword?” “I was a man,” I said, “before I was a magistrate; and, if it should ever happen that law could not protect me, I must protect myself.” He seemed about sixty years old, had a very cheerful countenance, and great appearance of good-nature, mixed with a certain dignity which distinguished him from the crowd of ministers and officers who attended him. Our conversation was interrupted by notice, that it was the time for evening-prayers; and, when he rose, he said, “This house is yours, and I will visit you in it after you have taken some refreshment.” Soon after, his servants brought a roast fowl, a rice-pudding, and some other dishes, with papayas and very good pomegranates: my own basket supplied the rest of my supper. The room was hung with old red cloth, and decorated with pieces of porcelain, and fettoons of *English* bottles; the lamps were placed on the ground in large sea-shells; and the bed-place was a recess, concealed by a chintz hanging opposite to the sofa on which we had been sitting. Though it was not a place that invited repose, and the gnats were inexpressibly troublesome,

troublesome, yet the fatigue of the day procured me very comfortable slumber. I was waked by the return of the king and his train; some of whom were *Arabs*, for I heard one say *huwa rākid*, or, *he is sleeping*. There was immediate silence; and I passed the night with little disturbance, except from the unwelcome songs of the mosquitos. In the morning all was equally silent and solitary; the house appeared to be deserted, and I began to wonder what had become of TUMU'NI: he came at length, with concern on his countenance, and told me that the bearers had run away in the night; but that the king, who wished to see me in another of his houses, would supply me with bearers, if he could not prevail on me to stay till a boat could be sent for. I went immediately to the king, whom I found sitting on a raised sofa in a large room, the walls of which were adorned with sentences from the *Korān*, in very legible characters. About fifty of his subjects were seated on the ground in a semicircle before him; and my interpreter took his place in the midst of them. The good old king laughed heartily when he heard the adventure of the night, and said. "you will now be my guest for a week I hope; but, seriously, if you must return soon, I will send into the country for some peasants to carry you." He then apologized for the behaviour of *Shakh* SA'LIM, which he had heard from TUMU'NI, who told me afterwards that he was much displeased with it, and would not fail to express his displeasure. He concluded with a long harangue on the advantage which the *English* might derive from sending a ship every year from *Bombay* to trade with his subjects, and on the wonderful cheapness of their commodities, especially of their cowries. Ridiculous as this idea might seem, it showed an enlargement of mind, a desire of promoting the interest of his people, and a sense of the benefits arising from trade, which could hardly have been



been expected from a petty *African* chief; and which, if he had been sovereign of *Yemen*, might have been expanded into rational projects proportioned to the extent of his dominions. I answered, that I was imperfectly acquainted with the commerce of *India*; but that I would report the substance of his conversation, and would ever bear testimony to his noble zeal for the good of his country, and to the mildness with which he governed it. As I had no inclination to pass a second night in the island, I requested leave to return without waiting for bearers. He seemed very sincere in pressing me to lengthen my visit; but had too much *Arabian* politeness to be importunate. We, therefore, parted; and at the request of TUMU'NI, who assured me that little time would be lost in showing attention to one of the worthiest men in *Hinzuin*, I made a visit to the Governor of the town, whose name was MUTEKKA. His manners were very pleasing; and he showed me some letters from the officers of the *Brilliant*, which appeared to flow warm from the heart, and contained the strongest *eloge* of his courtesy and liberality. He insisted on filling my basket with some of the finest pomegranates I had ever seen; and I left the town impressed with a very favourable opinion of the king and his governor. When I reascended the hill, attended by many of the natives, one of them told me in *Arabic*, that I was going to receive the highest mark of distinction that was in the king's power to show me; and he had scarce ended, when I heard the report of a single gun: *Shakh AHMED* had saluted me with the whole of his ordnance. I waved my hat, and said *Allah Achar*: the people shouted, and I continued my journey, not without fear of inconvenience from excessive heat and the fatigue of climbing rocks. The walk, however, was not on the whole unpleasant: I sometimes rested in the valleys and forded all the rivulets, which refreshed me with their coolness,

and

and supplied me with exquisite water to mix with the juice of my pomegranates, and occasionally with brandy. We were overtaken by some peasants who came from the hills by a nearer way, and brought the king's present of a cow with her calf, and a she-goat with two kids: they had apparently been selected for their beauty, and were brought safe to *Bengal*. The prospects which had so greatly delighted me the preceding day had not yet lost their charms, though they wanted the recommendation of novelty; but I must confess, that the most delightful object in that day's walk, of near ten miles, was the black frigate, which I discerned at sun-set, from a rock near the Prince's gardens. Close to the town I was met by a native, who, perceiving me to be weary, opened a fine cocoa-nut, which afforded me a delicious draught. He informed me that one of his countrymen had been punished that afternoon for a theft on board the *Crocodile*; and added, that, in his opinion, the punishment was no less just than the offence was disgraceful to his country. The offender, as I afterwards learned, was a youth of a good family, who had married a daughter of old ALWI', but, being left alone for a moment in the cabin, and seeing a pair of blue Morocco slippers, could not resist the temptation, and concealed them so ill under his gown, that he was detected with the manner. This proves that no principle of honour is instilled by education into the gentry of this island: even ALWI', when he had observed that, "In the month of *Ramadan* it was not lawful to paint with *Henna*, or to *tell lies*;" and when I asked whether both were lawful all the rest of the year, answered, that "lies were innocent, if no man was injured by them." TUMUN'I took his leave, as well satisfied as myself with our excursion. I told him, before his master, that I transferred also to him the dollars which were due to me out of the three guineas; and that

if ever they should part, I should be very glad to receive him into my service in *India*. Mr. ROBERTS, the master of the ship, had passed the day with *Sayyad AHMED*, and had learned from him a few curious circumstances concerning the government of *Hinzuin*, which he found to be a monarchy limited by an aristocracy. The king, he was told, had no power of making war by his own authority; but, if the assembly of nobles, who were from time to time convened by him, resolved on a war with any of the neighbouring islands, they defrayed the charges of it by voluntary contributions; in return for which they claimed as their own all the booty and captives that might be taken. The hope of gain or the want of slaves is usually the real motive for such enterprizes, and ostensible pretexts are easily found: at that very time, he understood, they meditated a war, because they wanted hands for the following harvest. Their fleet consisted of sixteen or seventeen small vessels, which they manned with about two thousand five hundred islanders, armed with muskets and cutlasses, or with bows and arrows. Near two years before, they had possessed themselves of two towns in *Mayáta*, which they still kept and garrisoned. The ordinary expences of the government were defrayed by a tax from two hundred villages; but the three principal towns were exempt from all taxes, except that they paid annually to the Chief *Mufti* a fortieth part of the value of all their moveable property; and from that payment neither the king nor the nobles claimed an exception. The kingly authority, by the principles of their constitution, was considered as elective, though the line of succession had not in fact been altered since the first election of a Sultan. He was informed, that a wandering *Arab*, who had settled in the island, had, by his intrepidity in several wars, acquired the rank of chieftain, and afterwards of a king with limited powers; and that he was the grandfather of *Shaikh AHMED*. I had been assured that Queer

HALI'MAH was his *grandmother*; and, that he was the *fifth* king; but it must be remarked, that the words *jedd* and *jeddah* in *Arabic* are used for a male and female *ancestor* indefinitely; and, without a correct pedigree of AHMED's family, which I expected to procure, but was disappointed, it would scarce be possible to ascertain the time when his forefather obtained the highest rank in the government. In the year 1600 *Captain* JOHN DAVIS, who wrote an account of his voyage, found *Mavata* governed by a king, and *Ansuame*, or *Hinzuan*, by a queen, who showed him great marks of friendship. He anchored before the town of *Demos* (does he mean *Dominoni*?) which was as large, he says, as *Plymouth*; and he concludes from the ruins around it, that it had once been a place of strength and grandeur. I can only say, that I observed no such ruins. Fifteen years after, *Captain* PEYTON and *Sir* THOMAS ROE touched at the *Comara Islands*; and from their several accounts, it appears that an old Sultaneß then resided in *Hinzuan*, but had a dominion paramount over all the isles, three of her sons governing *Mohila* in her name. If this be true, *SOHAILI'* and the successors of *HALI'MAH* must have lost their influence over the other islands; and, by renewing their dormant claim, as it suits their convenience, they may always be furnished with a pretence for hostilities. Five generations of eldest sons would account for an hundred and seventy of the years which have elapsed since DAVIS and PEYTON found *Hinzuan* ruled by a Sultaneß; and AHMED was of such an age, that his reign may be reckoned equal to a generation. It is probable, on the whole, that *HALI'MAH* was the widow of the first *Arabian* king, and that her mosque has been continued in repair by his descendants; so that we may reasonably suppose two centuries to have passed since a single *Arab* had the courage and address to establish in that beautiful island a form of government, which, though bad enough in itself, appears to have been administered with advantage to the original inhabitants. We have

lately heard of civil commotions in *Ilinzuàn*, which, we may venture to pronounce, were not excited by any cruelty or violence of AHMED, but were probably occasioned by the insolence of an oligarchy naturally hostile to king and people. That the mountains in the *Comara Islands* contain diamonds and the precious metal, which are studiously concealed by the policy of the several governments, may be true, though I have no reason to believe it, and have only heard it asserted without evidence; but I hope that neither an expectation of such treasures, nor of any other advantage, will ever induce an *European* power to violate the first principles of justice, by assuming the sovereignty of *Ilinzuàn*, which cannot answer a better purpose than that of supplying our fleets with seasonable refreshment; and, although the natives have an interest in receiving us with apparent cordiality; yet, if we wish their attachment to be unfeigned, and their dealings just, we must set them an example of strict honesty in the performance of our engagements. In truth, our nation is not cordially loved by the inhabitants of *Ilinzuàn*, who, as it commonly happens, form a general opinion from a few instances of violence or breach of faith. Not many years ago an *European*, who had been hospitably received, and liberally supported at *Matsumádo*, behaved rudely to a young married woman, who, being of low degree, was walking veiled through a street in the evening. Her husband ran to protect her, and resented the rudeness, probably with menaces, possibly with actual force; and the *European* is said to have given him a mortal wound with a knife or bayonet, which he brought, after the scuffle, from his lodging. This foul murder, which the law of nature would have justified the magistrate in punishing with death, was reported to the king, who told the governor (I use the very words of ALWI) that "it would be wiser to hush it up." ALWI mentioned a civil case of his own, which ought not to be concealed. When he was on the coast of *Africa*, in the dominions of a very savage prince,

prince, a small *European* vessel was wrecked; and the prince not only seized all that could be saved from the wreck, but claimed the captain and the crew as his slaves, and treated them with ferocious intolerance. ALWÍ' advised me, that when he heard of the accident, he hastened to the prince, fell prostrate before him, and by tears and importunity prevailed on him to give the *Europeans* their liberty; that he supported them at his own expence, enabled them to build another vessel, in which they sailed to *Huronan*, and departed thence for *Europe* or *India*. He showed me the Captain's promissory notes for fums, which to an *African* trader must be a considerable object, but which were no price for liberty, safety, and perhaps life, which his good, though disinterested, offices had procured. I lamented that, in my situation, it was wholly out of my power to assist ALWÍ' in obtaining justice; but he urged me to deliver an *Arabic* letter from him, enclosing the notes to the Governor-General, who, as he said, knew him well; and I complied with his request. Since it is possible that a substantial defence may be made by the person thus accused of injustice, I will not name either him or the vessel which he commanded; but, if he be living, and if this paper should fall into his hands, he may be induced to reflect how highly it imports our national honour, that a people, whom we call savage, but who administer to our convenience, may have no just cause to reproach us with a violation of our contracts.



## VI.

## ON THE BAYA, OR INDIAN GROSS-BEAK.

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 BY AT'HAR ALI KHAN OF DEHLI.
 

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THE little bird, called *Bayà* in *Hindî*, *Berbera* in *Sanscrit*, *Bibû* in the dialect of *Bengal*, *Cibû* in *Persian*, and *Tennawwit* in *Arabic*, from his remarkably *pendent* nest, is rather larger than a sparrow, with yellow-brown plumage, a yellowish head and feet, a light-coloured breast, and a conic beak very thick in proportion to his body. This bird is exceedingly common in *Hindustàn*; he is astonishingly sensible, faithful, and docile, never voluntarily deserting the place where his young were hatched, but not averse, like most other birds, to the society of mankind, and easily taught to perch on the hand of his master. In a state of nature he generally builds his nest on the highest tree that he can find, especially on the *Palmyra*, or on the *Indian fig-tree*, and he prefers that which happens to overhang a well or a rivulet; he makes it of grass, which he weaves like cloth and shapes like a large bottle, suspending it firmly on the branches, but so as to rock with the wind, and placing it with its entrance downwards to secure it from birds of prey. His nest usually consists of two or three chambers; and it is the popular belief, that he lights them with fire-flies, which he catches alive at night and confines with moist clay, or with cow-dung; that such flies are often found in his nest, where pieces of cow-dung are also stuck, is indubitable; but as their light could be of little use to him, it seems probable that he only feeds on them. He may be taught with ease to fetch a piece of paper,



paper, or any small thing, that his master points out to him. It is an attested fact, that, if a ring be dropped into a deep well, and a signal given to him, he will fly down with amazing celerity, catch the ring before it touches the water, and bring it up to his master with apparent exultation; and it is confidently asserted, that, if a house or any other place be shewn to him once or twice, he will carry a note thither immediately, on a proper signal being made. One instance of his docility I can myself mention with confidence, having often been an eye-witness of it. The young *Hindu* women at *Banâres*, and in other places, wear very thin plates of gold, called *t'cas*, slightly fixed by way of ornament between their eye-brows; and, when they pass through the streets, it is not uncommon for the youthful libertines, who amuse themselves with training *Bayâs*, to give them a sign which they understand, and send them to pluck the pieces of gold from the foreheads of their mistresses, which they bring in triumph to the lovers. The *Bayâ* feeds naturally on grasshoppers, and other insects, but will subsist, when tame, on pulse macerated in water. His flesh is warm and drying, of easy digestion, and recommended, in medical books, as a solvent of stone in the bladder, or kidneys; but of that virtue there is no sufficient proof. The female lays many beautiful eggs, resembling large pearls; the white of them, when they are boiled, is transparent, and the flavour of them is exquisitely delicate. When many *Bayâs* are assembled on a high tree, they make a lively din, but it is rather chirping than singing; their want of musical talents is, however, amply supplied by their wonderful sagacity, in which they are not excelled by any of the feathered inhabitants of the forest.

## VII.

### ON THE CHRONOLOGY OF THE HINDUS.

WRITTEN IN JANUARY, 1788.

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BY THE PRESIDENT.

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THE great antiquity of the *Hindus* is believed so firmly by themselves, and has been the subject of so much conversation among *Europeans*, that a short view of their Chronological System, which has not yet been exhibited from certain authorities, may be acceptable to those who seek truth without partiality to received opinions, and without regarding any consequences that may result from their inquiries. The consequences, indeed, of truth cannot but be desirable, and no reasonable man will apprehend any danger to society from a general diffusion of its light; but we must not suffer ourselves to be dazzled by a false glare, nor mistake enigmas and allegories for historical verity. Attached to no system, and as much disposed to reject the *Mosaic* history, if it be proved erroneous, as to believe it, if it be confirmed by sound reasoning from indubitable evidence, I propose to lay before you a concise account of *Indian* Chronology extracted from *Sanscrit* books, or collected from conversations with *Pundits*, and to subjoin a few remarks on their system, without attempting to decide a question, which I shall venture to start, “whether it is not in fact the same with  
“our own, but embellished and obscured by the fancy of their poets and  
“the riddles of their astronomers?”

ONE of the most curious books in *Sanscrit*, and one of the oldest after the *Pitâs*, is a tract on *religious and civil duties*, taken, as it is believed, from the oral instructions of MENV, son of BRAHMA', to the first inhabitants of the earth. A well-collated copy of this interesting law-tract is now before me; and I begin my dissertation with a few couplets from the first chapter of it: "The sun causes the division of day and night, which are of two sorts, those of men, and those of the Gods; the day for the labour of *all* creatures in their several employments; the night for their slumber. A month is a day and night of the Patriarchs; and it is divided into two parts; the bright half is *their* day for laborious exertions; the dark half, *their* night for sleep. A year is a day and night of the Gods; and that is also divided into two halves; the day is, when the sun moves toward the north; the night, when it moves toward the south. Learn now the duration of a night and day of BRAHMA' with that of the ages respectively and in order. Four thousand years of *the Gods* they call the *Crita* (or *Satya*) age; and its limits at the beginning and at the end *are*, in like manner, as many hundreds. In the three successive ages, together with their limits at the beginning and end of them, are thousands and hundreds diminished by one. This aggregate of four ages, amounting to twelve thousand divine years, is called an age of the Gods; and a thousand such divine ages added together, must be considered as a day of BRAHMA': his night has also the same duration. The before-mentioned age of the Gods, or twelve thousand of their years, multiplied by seventy-one, form what is named here below a *Manwantara*. There are alternate creations and destructions of *worlds* through innumerable *Manwantaras*: the Being supremely desirable performs all this again and again."

SUCH

SUCH is the arrangement of infinite time, which the *Hindus* believe to have been revealed from Heaven, and which they generally understand in a literal sense. It seems to have intrinsic marks of being purely astronomical; but I will not appropriate the observations of others, nor anticipate those in particular which have been made by two or three of our members, and which they will, I hope, communicate to the Society. A conjecture, however, of Mr. PATTERSON, has so much ingenuity in it, that I cannot forbear mentioning it here, especially as it seems to be confirmed by one of the couplets just cited. He supposes, that as a *month* of mortals is a day and night of the Patriarchs, from the analogy of its bright and dark halves, so, by the same analogy, a day and night of mortals might have been considered by the ancient *Hindus* as a month of the lower world; and then a year of such months will consist only of twelve days and nights; and thirty such years will compose a lunar year of mortals; whence he surmises that the *four million three hundred and twenty thousand* years, of which the four *Indian* ages are supposed to consist, mean only years of twelve days; and, in fact, that sum divided by *thirty*, is reduced to *an hundred and forty-four thousand*: now a *thousand four hundred and forty* years are one *pada*, a period in the *Hindu* astronomy; and that sum, multiplied by *eighteen*, amounts precisely to *twenty-five thousand nine hundred and twenty*, the number of years in which the fixed stars appear to perform their long revolution eastward. The last mentioned sum is the product also of *an hundred and forty-four*; which, according to M. BAILLY, was an old *Indian* cycle, into *an hundred and eighty*, or the *Tartarian* period called *Van*, and of *two thousand eight hundred and eighty* into *nine*, which is not only one of the lunar cycles, but considered by the *Hindus* as a mysterious number, and an emblem of Divinity, because, it it be multiplied by any other whole number, the sum of the figures in the

THE aggregate of their four ages they call a Divine Age, and believe that in every thousand such ages, or in every *day* of BRAHMA', *fourteen* MENUS are successively invested by him with the sovereignty of the earth: each MENU, they suppose, transmits his empire to his sons and grandsons during a period of seventy-one divine ages; and such a period they name a *Manwantara*; but, since *fourteen* multiplied by *seventy-one* are not quite a *thousand*, we must conclude that *six* divine ages are allowed for intervals between the *Manwantaras*, or for the twilight of BRAHMA's day. Thirty such days, or *Calpas*, constitute, in their opinion, a *month* of BRAHMA'; twelve such months, one of his years; and an hundred such years, his *age*; of which age they assert, that fifty years have elapsed. We are now then, according to the *Hindus*, in the first day or *Calpa* of the first month of the fifty-first year of BRAHMA's age, and in the twenty-eighth divine age of the seventh *Manwantara*; of which divine age the *three* first human ages have passed, and *four thousand eight hundred and eighty-eight* of the *fourth*.

IN the present day of BRAHMA', the first MENU was surnamed SWA'YAMBHUVA, or *Son of the Self-existent*; and it is he by whom the *Institutes of Religious and Civil Duties* are supposed to have been delivered. In his time the Deity descended at a *sacrifice*; and, by his wife SATARU'PA', he had two distinguished sons, and three daughters. This pair was created for the multiplication of the human species, after that new creation of the world which the *Bráhmans* call *Pádmacalpiya*, or the *Lotos-creation*.

IF it were worth while to calculate the age of MENU's Institutes, according to the *Bráhmans*, we must multiply four million three hundred and

and twenty thousand by six times seventy-one, and add to the product the number of years already past in the seventh *Manvantara*. Of the five MENUS, who succeeded him, I have seen little more than the names; but the *Hindu* writings are very diffuse on the life and posterity of the seventh MENU, surnamed VAIVASWATA, or *Child of the Sun*. He is supposed to have had ten sons, of whom the eldest was ICISHWA'CU; and to have been accompanied by seven *Rishis*, or holy persons, whose names were CASYAPA, ATRI, VASISHTHA, VISWA'MITRA, GAUTAMA, JAMADAGNI, and BHARADWA'JA; an account which explains the opening of the fourth chapter of the *Gîtâ*: "This immutable system of devotion," says CRISHNA, "I revealed to VIVASWAT, or the Sun; VIVASWAT declared it to his son MENU; MENU explained it to ICISHWA'CU: thus the Chief *Rishis* know this sublime doctrine delivered from one to another."

IN the reign of this *Sun-born* Monarch the *Hindus* believe the whole earth to have been drowned, and the whole human race destroyed by a flood, except the pious prince himself, the seven *Rishis*, and their several wives; for they suppose his children to have been born after the deluge. This general *pralaya*, or destruction, is the subject of the first *Purâna*, or *Sacred Poem*, which consists of fourteen thousand stanzas; and the story is concisely, but clearly and elegantly, told in the eighth book of the *Bhâgavata*, from which I have extracted the whole, and translated it with great care, but will only present you here with an abridgement of it. "The demon HAYAGRI'VA having purloined the *Vêdas* from the custody of BRAHMA, while he was reposing at the close of the sixth *Manvantara*, the whole race of men became corrupt, except the seven *Rishis* and SATYAVRATA, who then reigned in *Dravira*, a  
 " maritime

“ maritime region to the south of *Carnāta*. This prince was performing his ablutions in the river *Critamālā*, when *VISHNU* appeared to him in the shape of a small fish, and, after several augmentations of bulk in different waters, was placed by *SATYAVRATA* in the ocean, where he thus addressed his amazed votary: “ In *seven* days all creatures who have offended me shall be destroyed by a deluge; but thou shalt be secured in a capacious vessel miraculously formed; take therefore all kinds of medicinal herbs and esculent grain for food, and, together with the seven holy men, your respective wives, and pairs of all animals, enter the ark without fear; then shalt thou know God face to face, and all thy questions shall be answered.” Saying this, he disappeared; and after seven days, the ocean began to overflow the coasts, and the earth to be flooded by constant showers, when *SATYAVRATA*, meditating on the Deity, saw a large vessel moving on the waters: he entered it, having in all respects conformed to the instructions of *VISHNU*; who, in the form of a vast fish, suffered the vessel to be tied with a great sea-serpent; as with a cable, to his measureless horn. When the deluge had ceased, *VISHNU* slew the demon, and recovered the *Vēdas*, instructed *SATYAVRATA* in divine knowledge, and appointed him the seventh *MENU*, by the name of *VAIVASWATA*. Let us compare the two *Indian* accounts of the *Creation* and the *Deluge* with those delivered by *MOSES*. It is not made a question in this tract, whether the first chapters of *Genesis* are to be understood in a literal, or merely an allegorical sense. The only points before us are, whether the creation described by the *first MENU*, which the *Brahmans* call that of the *Lotos*, be not the same with that recorded in our Scripture? and whether the story of the *seventh MENU* be not one and the same with that of *NOAH*? I propose the question,

but

but affirm nothing; leaving others to settle their opinions, whether ADAM be derived from *âdim*, which in *Sanseerit* means the *first*, or MENU from NUH, the true name of the Patriarch; whether the *sacrifice*, at which GOD is believed to have descended, alludes to the offering of ABEL; and, on the whole, whether the two MENUS can mean any other persons than the great progenitor and the restorer of our species.

ON a supposition that VAIVASWATA, or *Sun-born*, was the NOAH of Scripture, let us proceed to the *Indian* account of his posterity, which I extract from the *Purânârt'haprecâsa*, or *The Purânas Explained*, a work lately composed in *Sanseerit* by RA'DHA'CA'NTA SARMA, a *Pandit* of extensive learning and great fame among the *Hindus* of this province. Before we examine the genealogies of kings, which he has collected from the *Purânas*, it will be necessary to give a general idea of the *Avatâras*, or *Descents*, of the Deity. The *Hindus* believe innumerable such descents or special interpositions of Providence in the affairs of mankind, but they reckon *ten* principal *Avatâras* in the current period of four ages; and all of them are described, in order as they are supposed to occur, in the following Ode of JAYADE'VA, the great Lyric Poet of *India*.

1. "THOU recoverest the *Vîda* in the water of the ocean of destruction, placing it joyfully in the bosom of an ark fabricated by thee, O  
 "CE'SAVA, assuming the body of a fish. Be victorious, O HERRI, Lord of  
 "the Universe!

2. "The earth stands firm on thy immensely broad back, which  
 "grows larger from the callus, occasioned by bearing that vast burden,  
 "O CE'SAVA,



“ O CE'SAVA, assuming the body of a *tortoise*. Be victorious, O HERI,  
 “ Lord of the Universe!

3. “ THE earth, placed on the point of thy tusk, remains fixed like  
 “ the figure of a black antelope on the moon, O CE'SAVA, assuming the  
 “ form of a *boar*. Be victorious, O HERI, Lord of the Universe!

4. “ THE claw with a stupendous point, on the exquisite lotos of thy  
 “ lion's paw, is the black bee that stung the body of the embowelled HIRA-  
 “ NYACASIPU, O CE'SAVA, assuming the form of a *man-lion*. Be victori-  
 “ ous, O HERI, Lord of the Universe!

5. “ By thy power thou beguilest BALI, O thou miraculous dwarf,  
 “ thou purifier of men with the water (of *Gangà*) springing from thy feet,  
 “ O CE'SAVA, assuming the form of a *dwarf*. Be victorious, O HERI,  
 “ Lord of the Universe!

6. “ Thou bathest in pure water, consisting of the blood of *Cshatriyas*,  
 “ the world, whose offences are removed, and who are relieved from the  
 “ pain of other births, O CE'SAVA, assuming the form of PARAS'U-RA'MA.  
 “ Be victorious, O HERI, Lord of the Universe!

7. “ WITH ease to thyself, with delight to the Genii of the eight re-  
 “ gions, thou scatterest on all sides in the plain of combat the demon with  
 “ ten heads, O CE'SAVA, assuming the form of RA'MA-CHANDRA. Be  
 “ victorious, O HERI, Lord of the Universe!

8. “ THOU

8. "THOU wearest on thy bright body a mantle shining like a blue cloud, or like the water of *Yamunâ*, tripping toward thee through fear of thy furrowing *ploughshare*, O CE'SAVA, assuming the form of BALA-RA'MA. Be victorious, O HĒRI, Lord of the Universe!

9. "THOU blamest (Oh wonderful!) the whole *Vêda*, when thou seest, O kind-hearted, the slaughter of cattle prescribed for sacrifice, O CE'SAVA, assuming the body of BUDDHA. Be victorious, O HĒRI, Lord of the Universe!

10. "FOR the destruction of all the impure thou drawest thy cymeter like a blazing comet (how tremendous!) O CE'SAVA, assuming the body of CALCI. Be victorious, O HĒRI, Lord of the Universe!"

THESE ten *Avatâras* are by some arranged according to the thousands of divine years in each of the four ages, or in an arithmetical proportion from four to one; and, if such an arrangement were universally received, we should be able to ascertain a very material point in the *Hindu* Chronology: I mean the birth of BUDDHA, concerning which the different *Pandits* whom I have consulted, and the same *Pandits* at different times, have expressed a strange diversity of opinion. They all agree that CALCI is yet to come, and that BUDDHA was the last considerable incarnation of the Deity; but the astronomers at *Varanes* place him in the *third* age; and RA'DHA'CA'NĀ infists that he appeared after the *thousandth* year of the *fourth*. The learned and accurate author of the *Dabysân*, whose information concerning the *Hindus* is wonderfully correct, mentions an opinion of the *Pandits* with whom he had conversed, that BUDDHA began his career *ten* years before the close of the third age; and GO'VERDHANA of *Cashmîr*, who had once informed

THE that CRISHNA descended *two centuries* before BUDDHA, assured me lately that the *Cashmirians* admitted an interval of *twenty-four* years (others allow only *twelve*) between those two divine persons. The best authority, after all, is the *Bhāgavat* itself, in the first chapter of which it is expressly declared that “BUDDHA, the son of JINA, would appear at *Cicatā*, for the “purpose of confounding the demons, *just at the beginning of the Calyug.*” I have long been convinced that, on these subjects, we can only reason satisfactorily from *written* evidence, and that our forensick rule must be invariably applied, *to take the declarations of the Brāhmans most strongly against themselves*, that is, *against their pretensions to antiquity*; so that, on the whole, we may safely place BUDDHA *just at the beginning of the present age*. But what is the *beginning* of it? When this question was proposed to RA'DHA'CA'NT, he answered, “of a period comprising “more than four hundred thousand years, the first two or three thousand “may reasonably be called *the beginning.*” On my demanding *written* evidence, he produced a book of some authority, composed by a learned *Gōswāmi*, and entitled *Bhāgavatāmrita*, or the *Nectar* of the *Bhāgavat*, on which it is a metrical comment; and the couplet which he read from it deserves to be cited. After the just mentioned account of BUDDHA in the text, the commentator says,

*Aśau vyaśtāḥ kalārabdasahasradwīṭayē gatē,  
Mūrtiḥ pātulavernā'sya dwibhujā chicutīj'hitā.*

- ‘He became visible, the-thousandth-and-second-year-of-the-Cali-age being  
‘past; his body of-a-colour-between-white-and-ruddy, with-two-arms,  
‘without-hair on his head.’

*Cicatā,*

*Cicata*, named in the text as the birth-place of BUDDHA, the *Gîfivâmi* supposes to have been *Dharmâranya*, a wood near *Gayâ*, where a colossal image of that ancient deity still remains. It seemed to me of black stone; but, as I saw it by torch-light, I cannot be positive as to its colour, which may, indeed, have been changed by time.

THE *Brâhmans* universally speak of the *Bauddhas* with all the malignity of an intolerant spirit; yet the most orthodox among them consider BUDDHA himself as an incarnation of VISHNU. This is a contradiction hard to be reconciled, unless we cut the knot, instead of untying it, by supposing with GIORGI, that there were *two* BUDDHAS, the younger of whom established the new religion, which gave so great offence in *India*, and was introduced into *China* in the first century of our era. The *Cashmirian* before mentioned asserted this fact, without being led to it by any question that implied it; and we may have reason to suppose that *Buddha* is in truth only a general word for a *Philosopher*. The author of a celebrated *Sanscrit* Dictionary, entitled from his name *Amarak'sha*, who was himself a *Bauddha*, and flourished in the first century before CHRIST, begins his vocabulary with nine words that signify *heaven*, and proceeds to those which mean *a deity in general*; after which come different *classes* of *Gods*, *Demigods*, and *Deities*, all by *general* names; and they are followed by two very remarkable heads; first (not the *general names* of BUDDHA, but) the names of a *Buddha-in-general*, of which he gives us eighteen, such as *Mian*, *Sîstî*, *Manindra*, *Vinâyaca*, *Samantabhadra*, *Dharmaraja*, *Sugata*, and the like; most of them significative of *excellence*, *wisdom*, *virtue*, and *sanctity*; secondly, the names of a *particular-Buddha-Mian-who-descended-in-the-family-of-SATYA* (those are the very words of the original) and his titles are. *Sâkraman*,

*Sācyasinha*, *Servārthasiddha*, *Saudhōdani*, *Gautama*, *Arcabandhu*, or *Kinsman of the Sun*, and *Māyidevīputa*, or *Child of MA'YA*: — thence the author passes to the different epithets of particular *Hindu* deities. When I pointed out this curious passage to RA'DHA'C'ANT, he contended, that the first eighteen names were *general* epithets, and the following seven *proper names*, or *patronymicks*, of one and the same person; but RA'MA-LO'CHAN, my own teacher, who, though not a *Brāhman*, is an excellent scholar, and a very sensible unprejudiced man, assured me that *Buddha* was a *generic* word, like *Déva*; and that the learned author, having exhibited the names of a *Dévatā* in general, proceeded to those of a *Buddha* in general, before he came to particulars: he added, that *Buddha* might mean a *Sage*, or a *Philosopher*, though *Budha* was the word commonly used for a mere *wise man* without supernatural powers. It seems highly probable, on the whole, that the BUDDHA whom JAYADÉVA celebrates in his Hymn, was the *Sācyasinha*, or *Lion of SA'CYA*, who, though he forbade the sacrifices of cattle, which the *Védas* enjoin, was believed to be VISHNU himself in a human form, and that another *Buddha*, one perhaps of his followers in a latter age, assuming his name and character, attempted to overturn the whole system of the *Brāhmanas*, and was the cause of that persecution from which the *Bauddhas* are known to have fled into very distant regions. May we not reconcile the singular difference of opinion among the *Hindus* as to the time of BUDDHA'S appearance, by supposing that they have confounded the *Two Buddhas*, the first of whom was born a few years before the close of the last age, and the second, when above a thousand years of the present age had elapsed? We know, from better authorities, and with as much certainty as can justly be expected on so doubtful a subject, the real time, compared with our own era, when the ancient BUDDHA began to distinguish

distinguish himself; and it is for this reason principally that I have dwelt with minute anxiety on the subject of the last *Avatar*.

THE *Brahmans* who assisted ABU'LFASI in his curious, but superficial account of his master's empire, informed him, if the figures in the *Ayn Akbari* be correctly written, that a period of 2962 years had elapsed from the birth of BUDDHA to the 40th year of ACBAR's reign, which computation will place his birth in the 1366th year before that of our Saviour; but, when the *Chinese* government admitted a new religion from *India* in the first century of our era, they made particular enquiries concerning the age of the old *Indian* BUDDHA, whose birth, according to COUPLER, they place in the 41st year of their 28th cycle, or 1036 years before CHRIST, and they call him, says he, FOE the son of MOYE, or MA'YA'; but M. DE GUIGNES, on the authority of four *Chinese* historians, asserts, that FO was born about the year before CHRIST 1027, in the kingdom of *Cashmir*. GIORGI, or rather CASSIANG, from whose papers his work was compiled, assures us, that by the calculation of the *Thibetians* he appeared only 959 years before the *Christian* epoch; and M. BAILLY, with some hesitation, places him 1031 years before it, but inclines to think him far more ancient; confounding him, as I have done in a former tract, with the *first* BUDHA, or MERCURY, whom the *Goths* called WODEN, and of whom I shall presently take particular notice. Now, whether we assume the medium of the four last-mentioned dates, or implicitly rely on the authorities quoted by DE GUIGNES, we may conclude that BUDDHA was first distinguished in this country *about a thousand* years before the beginning of our era; and whoever, in so early an age, expects a certain epoch, unqualified with *about* or *nearly*, will be greatly disappointed. Hence it is clear, that, whether the fourth age

of

of the *Hindus* began about *one* thousand years before CHRIST, according to GOVERDHAN's account of BUDDHA's birth, or *two* thousand according to that of RA'DHA'CA'NI, the common opinion, that 4888 years' of it are now elapsed, is erroneous; and here for the present we leave BUDDHA, with an intention of returning to him in due time; observing only, that if the learned *Indians* differ so widely in their accounts of the age when their ninth *Avatar* appeared in their country, we may be assured that they have no certain chronology before him, and may suspect the certainty of all the relations concerning even *his* appearance.

THE received chronology of the *Hindus* begins with an absurdity so monstrous, as to overthrow the whole system; for, having established their period of *seventy-one divine ages* as the reign of each *Menu*, yet thinking it incongruous to place a holy personage in times of *impurity*, they insist that the *Menu* reigns only in every *golden age*, and disappears in the *three human ages* that follow it; continuing to dive and emerge like a water-fowl till the close of his *Manvantara*. The learned author of the *Purāṇa-t'hapracāśa*, which I will now follow step by step, mentioned this ridiculous opinion with a serious face; but as he has not inserted it in his work, we may take his account of the seventh *Menu* according to its obvious and rational meaning, and suppose that VAIVASWATA, the son of SU'RYA, the son of CASYAPA, or *Uranus*, the son of MART'CHI, or *Light*, the son of BRAHMA', which is clearly an allegorical pedigree, reigned in the last golden age, or, according to the *Hindus*, three million eight hundred and ninety-two thousand eight hundred and eighty-eight years ago. But they contend, that he actually reigned on earth *one million seven hundred and twenty-eight thousand* years of mortals, or *four thousand eight hundred* years of the Gods; and this opinion is  
another

another monster so repugnant to the course of nature and to human reason, that it must be rejected as wholly fabulous, and taken as a proof that the *Indians* know nothing of their *Sun-born MENTU* but his name and the principal event of his life; I mean the *universal deluge*, of which the *three first Avatàrs* are merely allegorical representations, with a mixture, especially in the *second*, of astronomical mythology.

FROM this *MENTU* the whole race of men is believed to have descended; for the seven *Rishis* who were preserved with him in the ark, are not mentioned as fathers of human families; but since his daughter *ILA'* was married, as the *Indians* tell us, to the first *BUDHA*, or *Mercury*, the son of *CHANDRA*, or the *Moon*, a male deity, whose father was *ATRI*, son of *BRABMA'* (where again we meet with an allegory purely astronomical or poetical) his posterity are divided into two great branches, called the *Children of the Sun*, from his own supposed father; and the *Children of the Moon*, from the parent of his daughter's husband. The lineal male descendants in both these families are supposed to have reigned in the cities of *Ayodhya*, or *Audh*, and *Pratishthána*, or *Vitóra*, respectively, till the *thousandth year of the present age*; and the names of all the princes in both lines having been diligently collected by *RA'DHA'CA'NT* from several *Puránas*, I exhibit them in two columns, arranged by myself with great attention.



## S E C O N D   A G E .

## CHILDREN OF THE

SUN.

MOON.

	ICSHWA'CU,	BUDHA,	
	<i>Vicucshi,</i>	<i>Pururavas,</i>	
	Cucutft'ha,	Ayush,	
	Anénas,	Nahusha,	
5.	<i>Prit'hu,</i>	<i>Yayáti,</i>	5.
	Vis'wagandhi,	<i>Puru,</i>	
	Chandra,	Janaméjaya,	
	Yuvanás'wa,	Prachinwat,	
	Sráva,	Pravira,	
10.	Vrihadás'wa,	Menasyu,	10.
	Dhundhumára,	Chárupada,	
	Drid'hás'wa,	Sudyu,	
	Heryas'wa,	Bahugava,	
	Nicumbha,	Sanyáti,	
15.	Cris'ás'wa,	Ahanyáti,	15.
	Sénajit,	Raudrás'wa,	
	Yuvanás'wa,	Ritéyush,	
	Mándhátri,	Rantináva,	
	Purucutfa,	Sumati,	
20.	Trafadafyu,	Aiti,	20.
	Anaranya,	<i>Dushmanta,</i>	
	Heryas'wa,	<i>Bharata, *</i>	
	Praruna,	(Vitat'ha,	

CHILDREN

## CHILDREN OF THE

## SUN.

## MOON.

	Trivindhana,	Manyu,	
25.	Satyavrata,	Vrihatcshétra,	25.
	Tris'ancu,	Haftin,	
	Haris'chandra,	Ajamid'ha,	
	Róhita,	Ricsha,	
	Harita,	Samwarana,	
30.	Champa,	<i>Curu</i> ,	30.
	Sudéva,	<i>Jahnu</i> ,	
	Vijaya,	Surat'ha,	
	Bharuca,	Vidúrat'ha,	
	Vrica,	Sárvabhauma,	
35.	Báhuca,	Jayatféna,	35.
	<i>Sagara</i> ,	Rád'hica,	
	Afamanjas,	Ayutáyufh,	
	Ans'umat,	Acródhana,	
	<i>Bhagírat'ha</i> ,	Dévátit'hi,	
40.	Sruta,	Ricsha,	40.
	Nábha,	<i>Dilipa</i> ,	
	Sindhudwípa,	Pratípa,	
	Ayutáyufh,	Sántanu,	
	Ritaperna,	<i>Vichitravírya</i> ,	
45.	Saudáfa,	Pándu,	45.
	Asmaca,	<i>Yudhisht'hir</i> ).	
	Múlaca,		
	Daśarat'ha,		

## CHILDREN OF THE

SUN

MOON.

- A'dabidi,  
 50. Viswafaha,  
 C'hatwānga,  
 Dirghabāhu,  
 Raghu,  
 Aja,  
 55. Duśarat'ha,  
 RA'MA.

IT is agreed among all the *Pandits*, that RA'MA, their *seventh* incarnate divinity, appeared as King of *Ayódhyā* in the *interval* between the *silver* and the *brazen* ages; and, if we suppose him to have begun his reign at the very beginning of that interval, still *three thousand three hundred* years of the Gods, or *a million one hundred and eighty-eight thousand* lunar years of mortals, will remain in the *silver* age, during which the *fifty-five* princes between VAIVASWATA and RA'MA must have governed the world; but, reckoning *thirty* years for a generation, which is rather too much for a long succession of *eldest* sons, as they are said to have been, we cannot, by the course of nature, extend the *second* age of the *Hindus* beyond *sixteen hundred and fifty* solar years. If we suppose them not to have been *eldest* sons, and even to have lived longer than modern princes in a *dissolute* age, we shall find only a period of *two thousand* years; and, if we remove the difficulty by admitting miracles, we must cease to reason, and may as well believe at once whatever the *Bráhmans* chuse to tell us.

IN

IN the *Lunar* pedigree we meet with another absurdity equally fatal to the credit of the *Hindu* system. As far as the twenty-second degree of descent from VAIVASWATA, the synchronism of the two families appears tolerably regular, except that the Children of the Moon were not all *eldest* sons; for king YAYATI appointed the youngest of his five sons to succeed him in *India*, and allotted inferior kingdoms to the other four who had offended him; part of the *Deccan*, or the *South*, to YADU, the ancestor of CRISHNA; the north to ANU; the east to DRUHYA; and the west to TURVASU; from whom the *Pandits* believe, or pretend to believe, in compliment to our nation, that we are descended. But of the subsequent degrees in the lunar line they know so little, that, unable to supply a considerable interval between BHARAT and VITAT'HA, whom they call his son and successor, they are under a necessity of asserting, that the great ancestor of YUDHISHTHIR actually reigned *seven-and-twenty thousand years*; a fable of the same class with that of his wonderful birth, which is the subject of a beautiful *Indian* drama. Now, if we suppose his life to have lasted no longer than that of other mortals, and admit VITAT'HA and the rest to have been his regular successors, we shall fall into another absurdity; for then, if the generations in both lines were nearly equal, as they would naturally have been, we shall find YUDHISHTHIR, who reigned confessedly at the close of the *brazen* age, nine generations older than RA'MA, before whose birth the *silver* age is allowed to have ended. After the name of BHARAT, therefore, I have set an asterisk, to denote a considerable chasm in the *Indian* History, and have inserted between brackets, as out of their places, his *twenty-four* successors, who reigned, if at all, in the following age immediately before the war of the *Mahābhārat*. The fourth *Avatār*, which is placed in the interval between the *first* and

*Second* ages, and the *fifth*, which soon followed it, appear to be moral fables grounded on historical facts: the *fourth* was the punishment of an impious monarch, by the Deity himself *bursting from a marble column*, in the shape of a *lion*; and the *fifth* was the humiliation of an arrogant prince by so contemptible an agent as a mendicant *dwarf*. After these, and immediately before BUDDHA, come three great warriors, all named RA'MA; but it may justly be made a question, whether they are not three representations of one person, or three different ways of relating the same history. The first and second RA'MAS are said to have been contemporary; but whether all or any of them mean RAMA, the son of CU'SH, I leave others to determine. The mother of the second RAMA was named CAU'SHALYA', which is a derivative of CUSHALA; and, though his father be distinguished by the title or epithet of DA'SARAT'HA, signifying that *his war-chariot bore him to all quarters of the world*, yet the name of CUSH, as the *Cáshmirians* pronounce it, is preserved entire in that of his son and successor, and shadowed in that of his ancestor VICUESHI; nor can a just objection be made to this opinion from the nasal *Arabian* vowel in the word *Rámuh* mentioned by MOSES, since the very word *Arab* begins with the same letter, which the *Greeks* and *Indians* could not pronounce; and they were obliged, therefore, to express it by the vowel which most resembled it. On this question, however, I assert nothing; nor on another, which might be proposed, "whether the *fourth* and *fifth* *Avatàrs* be not allegorical stories of the two pre-sumptuous monarchs, NIMROD and BELUS?" The hypothesis, that government was first established, laws enacted, and agriculture encouraged in India by RAMA about *three thousand eight hundred years* ago, agrees with the received account of NOAH'S death, and the previous settlement of his immediate descendants.

## T H I R D   A G E .

## CHILDREN OF THE

SUN.

MOON.

	<i>Cus'ha,</i>	
	<i>Atit'hi,</i>	
	<i>Nishadha,</i>	
	<i>Nabhas,</i>	
5.	<i>Pundarîca</i>	
	<i>Cshémadhanwas,</i>	<i>Vitat'ha,</i>
	<i>Dévânica,</i>	<i>Manyu,</i>
	<i>Ahínagu,</i>	<i>Vrihatschétra,</i>
	<i>Páripáttra,</i>	<i>Haftin,</i>
10.	<i>Ranach'hala,</i>	<i>Ajamíd'ha,</i> 5.
	<i>Vayranabha,</i>	<i>Ricsha,</i>
	<i>Arca,</i>	<i>Samwarana,</i>
	<i>Sugana,</i>	<i>Cura,</i>
	<i>Vidhriti,</i>	<i>Jahnu,</i>
15.	<i>Hiranyanábha,</i>	<i>Surat'ha,</i> 10.
	<i>Pushya,</i>	<i>Vidúrat'ha,</i>
	<i>Dhruvatandhi,</i>	<i>Sárvabhauma,</i>
	<i>Suders'ana,</i>	<i>Jayatfena,</i>
	<i>Agnivera,</i>	<i>Rád'hica,</i>
20.	<i>Sighra,</i>	<i>Ayutáyush,</i> 15.
	<i>Manu,</i> supposed to be still alive.	<i>Acródhana,</i>
	<i>Prasus'ruta,</i>	<i>Devatit'hi,</i>
	<i>Sandhi,</i>	<i>Ricsha,</i>

CHILDREN

CHILDREN OF THE	
SUN.	MOON.
Amers'ana,	Dilipa,
25. Mahaswat,	Pratipa, 20.
Vis'wabháhu,	Sántanu,
Praçinajit,	Vichitravírya,
Tacshaca,	Pándu,
Vrihadbala,	Yudhisht'hira,
30. Vrihadran'a, Y. B. C. 1300.	Paricshit, 25.

HERE we have only *nine-and-twenty* princes of the solar line between RA'MA and VRIHADRA'NA exclusively; and their reigns, during the whole *brazen* age, are supposed to have lasted near *eight hundred and sixty-four thousand* years, a supposition evidently against nature; the uniform course of which allows only a period of *eight hundred and seventy* (or, at the very utmost, of *a thousand*) years for *twenty-nine* generations. PARICSHIT, the great nephew and successor of YUDHISHT'HIR, who had recovered the throne from DURYODHAN, is allowed without controversy to have reigned in the interval between the *brazen* and *earthen* ages, and to have died at the setting-in of the *Caliny*; so that, if the *Pandits* of *Cashmir* and *Varánes* have made a right calculation of BUDDHA'S appearance, the present, or *fourth*, age must have begun about *a thousand* years before the birth of CHRIST; and consequently the reign of ICSHWA'CU could not have been earlier than *four thousand* years before that great epoch; and even that date will perhaps appear, when it shall be strictly examined, to be near *two thousand* years earlier than the truth. I cannot leave the third *Indian* age, in which the virtues and vices of mankind are said to have been equal, without observing, that even the

close of it is manifestly fabulous and poetical, with hardly more *appearance* of historical truth than the tale of *Troy* or of the *Argonauts*; for YUDHISHT'HIR, it seems, was the son of DHERMA, the *Genius of Justice*; BHISHMA of PAVAN, or the *God of Wind*; ARJUN of INDRA, or the *Firmament*; NACUL and SAHADE'VA, of the two CUMA'RS, the CASTOR and POLLUX of *India*; and BHISHMA, their reputed great uncle, was the child of GANGA', or the GANGES, by SA'NTANU, whose brother DE'VA'PI is supposed to be still alive in the city of *Culúpa*; all which fictions may be charming embellishments of an heroic poem, but are just as absurd in civil history as the descent of two royal families from the Sun and the Moon.

## FOURTH AGE.

## CHILDREN OF THE

## SUN.

## MOON.

Urucriya,	<i>Junamájaya,</i>	
Vatlaviddha,	<i>Satánú'a,</i>	
Prativyóma,	Sahasr. n'ca,	
Bhann,	As'wamedhaja,	
5. Dévaca,	Asimacrishna,	5.
Sahadéva,	Némichakra,	
Víra,	Upta,	
Vrihadas'wa,	Chitrarat'ha,	
Bhínumat,	Suchirat'ha,	
10. Prat. cá's'wa,	Dhritimat,	10.
Suprat.ca,	Sushéna,	

CHILDREN



## CHILDREN OF THE

	SUN.		MOON.
	Marudeva,	Sunít'ha,	
	Sunac'hatra,	Nrichac'shuh,	
	Pufhcara,	Suc'hinala,	
15.	Antaric'sha,	Pariplava,	15.
	Sutapas,	Sunaya,	
	Amitrajít,	Médhávin,	
	Vrihadrája,	Nripanjaya,	
	Barhi,	Derva,	
20.	Critanjāya,	Timi	20.
	Ran'anjaya,	Vrihadrat'ha,	
	Sanjaya,	Sudāsa,	
	Slócyā,	Satánica,	
	Suddhóda,	Durmadana,	
25.	Lāngalada,	Rahinara,	25.
	Pras'énajit,	Dand'apáni,	
	C'shudraca,	Nimi,	
	Sumitra, Y. B. C. 2100	C'shémaca.	

IN both families we see *thirty* generations are reckoned from YUDHISHTHIR and from VRIHADRALA his contemporary (who was killed in the war of *Bhárat*, by ABHIMANYU, son of ARJUN, and father of PARI'CSHIT) to the time when the *Solar* and *Lunar* dynasties are believed to have become extinct in the present divine age; and for these generations the *Hindus* allot a period of *one thousand* years only, or a *hundred* years for *three* generations; which calculation, though probably

bly too large, is yet moderate enough, compared with their absurd accounts of the preceding ages: but they reckon exactly the same number of years for *twenty* generations only in the family of JARA'SANDHA, whose son was contemporary with YUDHISHT'HIR, and founded a new dynasty of princes in *Magadha*, or *Bahèr*; and this exact coincidence of the time in which the three races are supposed to have been extinct, has the appearance of an artificial chronology, formed rather from imagination than from historical evidence; especially as twenty kings, in an age comparatively modern, could not have reigned a thousand years. I, nevertheless, exhibit the list of them as a curiosity; but am far from being convinced that all of them ever existed: that, if they did exist, they could not have reigned more than *seven hundred* years, I am fully persuaded by the course of nature and the concurrent opinion of mankind.

## KINGS OF MAGADHA.

Sahadéva,	Suchi,	
Márjari,	Cshéma,	
Srutasiavas,	Suvrata,	
Ayutâyush,	Dhermasûtra,	
5. Niramitra,	Srama,	15.
Sunacshatra,	Dri'd'haféna,	
Vrihetféna,	Sumati,	
Carmajit,	Subala,	
Srutanjaya,	Sunîta,	
10. Vipra,	Satyajit.	20.

PURANJAYA, son of the twentieth king, was put to death by his minister SUNACA, who placed his own son PRADYOTÂ on the throne

of his master; and this revolution constitutes an epoch of the highest importance in our present inquiry; first, because it happened, according to the *Bhāgavatāmīta*, two years exactly before BUDDHA's appearance in the same kingdom; next, because it is believed by the *Hindus* to have taken place *three thousand eight hundred and eighty-eight* years ago, or *two thousand one hundred* years before CHRIST; and lastly, because a regular chronology, according to the number of years in each dynasty, has been established from the accession of PRADYÓTA to the subversion of the genuine *Hindu* government; and that chronology I will now lay before you, after observing only that RA'DHA'CA'NT himself says nothing of BUDDHA in this part of his work, though he particularly mentions the two preceding *Avatāras* in their proper places.

### KINGS OF MAGADHA.

Pradyóta

Y. B. C.

2100

Pálaca,

Visác'hayúpa,

Rájaca,

Nandiverdhana, 5 reigns = 138 years.

Sis'unága,

1962

Cácaverna,

Cshémadherman,

Cshétrajnya,

Vidhisára,

5.

Ajátasatru,

Darbhaca,

KINGS

## KINGS OF MAGADHA.

Y. B. C.

Ajaya  
 Nandiverdhana,  
 Mahánandi, 10 r = 3001.

NANDA,

1602

THIS prince, of whom frequent mention is made in the *Sanscrit* books, is said to have been murdered, after a reign of a *hundred years*, by a very learned and ingenious, but passionate and vindictive, *Brahman*, whose name was CHANACYA, and who raised to the throne a man of the *Maurya* race, named CHANDRAGUPTA. By the death of NANDA and his sons the *Cshatriya* family of PRADYO'TA became extinct.

## MAURYA KINGS.

Y. B. C.

1502

Chandragupta,  
 Varifara,  
 Afocaverdhana,  
 Suyas'as,  
 Des'arat'ha 5-  
 Sangata,  
 Sális'úca,  
 Sómas'arman,  
 Satadhanwas,  
 Vrihadrat'ha, 10 r = 1373.

ON the death of the tenth *Māurya* king, his place was assumed by his Commander in Chief, PUSHPAMITRA, of the *Sunga* nation or family.

### SUNGA KINGS.

	Y. B. C.
Pufhpamitra,	1365
Agnimitra,	
Sujyészth'a,	
Vafumitra,	
Abhadraça,	5.
Pulinda,	
Ghósha,	
Vajramitra,	
Bhágavata,	
Dévabhúti,	10 r = 112 y.

THE last prince was killed by his minister VASUDE'VA, of the *Canna* race, who usurped the throne of *Mugadha*.

### CANNA KINGS.

	Y. B. C.
Vafudéva,	1253
Bhúmitra,	
Náráyana,	
Sufarman,	4 r = 345 y.

*A Súra*

A *Súdra*, of the *Andhra* family, having murdered his master SUSAR-MAN, and seized the government, founded a new dynasty of

### ANDHRA KINGS.

	Y. B. C.
Balin,	908
Crishna,	
Srisántacarna,	
Paurnamáfa,	
Lambódara,	5.
Vivilaca	
Méghaswáta,	
Vátamána,	
Talaca,	
Sivaśwáti,	10.
Purishabhéru,	
Sunandana,	
Chacóracá,	
Ba'taca,	
Gómatin,	15.
Purimat,	
Médas'iras,	
Sirascand'ha,	
Yajnyas'ri,	
Vijaya,	20.
Chandrabíja,	21 $r = 456$ y.

AFTER

AFTER the death of CLANDRABĪJA, which happened, according to the *Hindus*, 396 years before VICRAMADITYA, or 452 B. C. we hear no more of *Magadha* as an independent kingdom; but RA'DHACĀNT has exhibited the names of *seven* dynasties, in which *seventy-six* princes are said to have reigned *one thousand three hundred and ninety-nine* years in *Avabhriti*, a town of the *Dashin*, or *South*, which we commonly call *Decan*. The names of the seven dynasties, or of the families who established them, are *Abhira*, *Gardabhin*, *Canca*, *Yavana*, *Turushcara*, *Bhūnanda*, *Maula*; of which the *Yavanas* are by some, not generally, supposed to have been *Ionians*, or *Greeks*; but the *Turushcaras* and *Maulas* are universally believed to have been *Turcs* and *Moguls*; yet RA'DHACĀNT adds, "When the *Maula* race was extinct, five princes, named *Bhūnanda*, "*Bangna*, *Sis'unandi*, *Yas'unandi*, and *Praviraca*, reigned *an hundred* "*and six* years (or till the year 1053) in the city of *Cilucilā*," which, he tells me, he understands to be in the country of the *Mahārāshtras*, or *Mahrattas*; and here ends his *Indian Chronology*; for "after *PRAVIRACA*," says he, "this empire was divided among *Mlech'has*, or *Infidels*." This account of the *seven modern dynasties* appears very doubtful in itself, and has no relation to our present enquiry; for their dominion seems confined to the *Decan*, without extending to *Magadha*; nor have we any reason to believe that a race of *Grecian* princes ever established a kingdom in either of those countries. As to the *Moguls*, their dynasty still subsists, at least nominally, unless that of *Chengiz* be meant, and his successors could not have reigned in any part of *India* for the period of *three hundred* years, which is assigned to the *Maulas*; nor is it probable that the word *Turc*, which an *Indian* could have easily pronounced and clearly expressed in the *Nāgarī* letters, should have been corrupted into *Turushcara*. On the whole, we may safely close the most authentic system

system of *Hindu* Chronology that I have yet been able to procure, with the death of CHANDRABHĪJA. Should any farther information be attainable, we shall, perhaps, in due time, attain it either from books or inscriptions in the *Sanscrit* language; but, from the materials with which we are at present supplied, we may establish as indubitable the two following propositions: that the *three first* ages of the *Hindus* are chiefly *mythological*, whether their mythology was founded on the dark enigmas of their astronomers, or on the heroic fictions of their poets; and that the *fourth*, or *historical*, age cannot be carried farther back than about two thousand years before CHRIST. Even in the history of the present age, the generations of men and the reigns of kings are extended beyond the course of nature, and beyond the average resulting from the accounts of the *Brahmans* themselves; for they assign to *an hundred and forty-two* modern reigns a period of *three thousand one hundred and fifty-three* years, or about *twenty-two* years to a reign one with another; yet they represent only four *Conna* princes on the throne of *Magadha* for a period of *three hundred and forty-five* years; now it is even more improbable that four successive kings should have reigned *eighty-six years and three months* each, than that NANDA should have been king a *hundred* years, and murdered at last. Neither account can be credited; but that we may allow the highest probable antiquity to the *Hindu* government, let us grant, that *three generations* of men were equal on an average to *an hundred* years, and that *Indian* princes have reigned, one with another, *two-and-twenty*: then reckoning thirty generations from ARJUN, the brother of YUDHISHTHIRA, to the extinction of his race, and taking the *Chinese* account of BUDDHA's birth from M. DE GUIGNES, as the most authentic medium between ABU'FGAZI and the *Thibetans*, we may arrange the corrected *Hindu* Chronology, according to the following table,

supplying



supplying the word *about* or *nearly* (since perfect accuracy cannot be attained and ought not to be required) before every date.

	Y. B. C.
Abhimanyu, <i>son of</i> ARJUN,	2029
Pradyóta,	1029
BUDDHA,	1027
Nanda,	699
Balin,	149
VICRAMA'DITYA,	56
DE'VAPA'LA, <i>king of</i> Gaur,	23

If we take the date of BUDDHA's appearance from ABU'LF AZL, we must place ABHIMANYU 2368 years before CHRIST, unless we calculate from the twenty kings of *Magadha*, and allow *seven hundred* years, instead of a *thousand*, between ARJUN and PRADYÓTA, which will bring us again very nearly to the date exhibited in the table; and, perhaps, we can hardly approach nearer to the truth. As to *Raja* NANDA, if he really sat on the throne a whole century, we must bring down the *Andhra* dynasty to the age of VICRAMA'DITYA, who with his feudatories had probably obtained so much power during the reign of those princes, that they had little more than a nominal sovereignty, which ended with CHANDRABÍJA in the *third* or *fourth* century of the *Christian* era; having, no doubt, been long reduced to insignificance by the kings of *Gaur*, descended from GO'PA'LA. But, if the author of the *Dabistán* be warranted in fixing the birth of BUDDHA *ten* years before the *Caliyug*, we must thus correct the Chronological Table:

Y. B. C.

BUDDHA,	1027
Paricshit,	1017
Pradyóta (reckoning 20 or 30 generations)	317 or 17

Y. A. C.

Nanda,	13 or 313
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THIS correction would oblige us to place VICRAMA'DITYA before NANDA, to whom, as all the *Pandits* agree, he was long posterior; and, if this be an historical fact, it seems to confirm the *Bhágawatámrita*, which fixes the beginning of the *Caliyug* about a thousand years before BUDDHA; besides that BALIN would then be brought down at least to the sixth, and CHANDRABI'JA to the tenth century after CHRIST, without leaving room for the subsequent dynasties, if they reigned successively.

THUS have we given a sketch of *Indian* history through the longest period fairly assignable to it, and have traced the foundation of the *Indian* empire above three thousand eight hundred years from the present time; but, on a subject in itself so obscure, and so much clouded by the fictions of the *Bráhmans*, who, to aggrandize themselves, have designedly raised their antiquity beyond the truth, we must be satisfied with probable conjecture and just reasoning from the best attainable data; nor can we hope for a system of *Indian* Chronology, to which no objection can be made, unless the astronomical books in *Sanscrit* shall clearly ascertain the places of the colures in some precise years of the historical age, not by loose traditions, like that of a coarse observation by CHIRON,

who possibly never existed (for "he lived," says NEWTON, "in the *golden* " age," which must long have preceded the *Argonautic* expedition) but by such evidence as our own astronomers and scholars shall allow to be unexceptionable.

## A CHRONOLOGICAL TABLE,

ACCORDING TO ONE OF THE HYPOTHESES INTIMATED IN THE  
PRECEDING TRACT.

CHRISTIAN and MUSELMAN	HINDU.	Years from 1788 of our era.
ADAM,	MENU I. Age I.	5794
NOAH,	MENU II.	4737
Deluge,		4138
<i>Nimrod,</i>	<i>Hiranyacāṣṭhu.</i> Age II.	4006
<i>Bel,</i>	<i>Bali,</i>	3892
RAMA,	RAMA. Age III.	3817
<i>Noah's death,</i>		3787
	<i>Pradyōta,</i>	2817
	BUDDHA. Age IV	2815
	<i>Nanda,</i>	2487
	<i>Balin,</i>	1937
	<i>Vicramāditya,</i>	1844
	<i>Dēvapāla,</i>	1811
CHRIST,		1787
	<i>Nārāyanpāla,</i>	1721
	<i>Saca,</i>	1709
<i>Walid,</i>		1080
<i>Mahmūd,</i>		786
<i>Chengiz,</i>		548
<i>Taimūr,</i>		391
<i>Babur,</i>		276
<i>Nādirshāh,</i>		49



## VIII.

### ON THE CURE OF THE ELEPHANTIASIS.

---

BY AT'HAR ALI KHAN OF DEHLI.

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#### INTRODUCTORY NOTE.

**A**MONG the afflicting maladies, which punish the vices and try the virtues of mankind, there are few disorders, of which the consequences are more dreadful, or the remedy in general more desperate, than the *judham* of the *Arabs*, or *khôrah* of the *Indians*. It is also called in *Arabia dâul'sâd*: a name corresponding with the *Leontiasis* of the *Greeks*, and supposed to have been given in allusion to the grim, distracted, and *lion-like* countenances of the miserable persons who are affected with it. The more common name of the distemper is *Elephantiasis*, or, as *LUCRETIVS* calls it, *Elephas*, because it renders the skin like that of an *Elephant*, uneven and wrinkled, with many tubercles and furrows; but this complaint must not be confounded with the *dâul'sil*, or *swelled legs*, described by the *Arabian* physicians, and very common in this country. It has no fixed name in *English*, though *HILLARY*, in his *Observations on the Diseases of Barbadoes*, calls it the *leprosy of the joints*, because it principally affects the extremities; which in the last stage of the malady are distorted, and at length drop off; but, since it is in truth a distemper corrupting the whole mass of blood, and therefore considered by *PAUL* of *Ægma* as an *universal ulcer*, it requires a more general appellation, and may properly be named the *Black Leprosy*; which term is in fact adopted by *M. BOISSIEU de SAUVAGES* and *GORRÆUS*, in

contra-

contradistinction to the *White* Leprosy, or the *Beres* of the *Arabs*, and *Leuce* of the *Greeks*.

THIS disease, by whatever name we distinguish it, is peculiar to hot climates, and has rarely appeared in *Europe*. The philosophical poet of *Rome* supposes it confined to *the Banks of the Nile*; and it has certainly been imported from *Africa* into the *West India*-Islands by the black slaves, who carried with them their resentment and their revenge; but it has been long known in *Hindustan*: and the writer of the following Dissertation, whose father was physician to NA'DIRSHAH, and accompanied him from *Persia* to *Dehli*, assures me that it rages with virulence among the native inhabitants of *Calcutta*. His observation, that it is frequently a consequence of the *venereal infection*, would lead us to believe that it might be radically cured by *Mercury*; which has, nevertheless, been found ineffectual, and even hurtful, as HILLARY reports, in the *West Indies*. The juice of *hemlock*, suggested by the learned MICHAELIS, and approved by his medical friend ROEDERER, might be very efficacious at the beginning of the disorder, or in the milder sorts of it; but, in the case of a malignant and inveterate *judhām*, we must either administer a remedy of the highest power, or, agreeably to the desponding opinion of CRÆSUS, leave the patient to his fate, instead of teasing him with fruitless medicines, and suffer him, in the forcible words of ARETÆUS, to sink from inextricable slumber into death. The life of a man is, however, so dear to him by nature, and in general so valuable to society, that we should never despond while a spark of it remains; and, whatever apprehensions may be formed of future danger from the distant effects of *arsenic*, even though it should eradicate a present malady, yet, as no such inconvenience has arisen from the use of it

in *India*, and, as Experience must ever prevail over Theory, I cannot help wishing that this ancient *Hindu* medicine may be fully tried under the inspection of our *European* Surgeons, whose minute accuracy and steady attention must always give them a claim to superiority over the most learned natives; but many of our countrymen have assured me, that they by no means entertain a contemptuous opinion of the native medicines, especially in diseases of the skin. Should it be thought that the mixture of sulphur must render the poison less active, it may be advisable at first to administer orpiment, instead of the *crystalline arsenic*.





## ON THE CURE OF THE ELEPHANTIASIS AND OTHER DISORDERS OF THE BLOOD.

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### GOD IS THE 'ALL-POWERFUL HEALER.

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I N the year of the MESSIAH 1783, when the worthy and respectable *Maulavi* MÍR MUHAMMED HUSAI'N, who excels in every branch of useful knowledge, accompanied Mr. RICHARD JOHNSON from *Lac'hnan* to *Calcutta*, he visited the humble writer of this tract, who had long been attached to him with sincere affection; and, in the course of their conversation, 'One of the fruits of my late excursion,' said he, 'is a present for you, which suits your profession, and will be generally useful to our species. Conceiving you to be worthy of it by reason of your assiduity in medical enquiries, I have brought you a prescription, the ingredients of which are easily found, but not easily equalled as a powerful remedy against all corruptions of the blood, the *julhim*, and the *Persian* fire, the remains of which are a source of infinite maladies. It is an old secret of the *Hindu* physicians; who applied it also to the cure of cold and moist distempers; as the palsy, distortions of the face, relaxation of the nerves, and similar diseases: its efficacy too has been proved by long experience; and this is the method of preparing it.

' TAKE of white *arsenic*, fine and fresh, one *toli*; of picked black pepper six times as much: let both be well beaten at intervals, for four days successively, in an iron mortar, and then reduced to an impalpable powder in

‘ one of stone with a stone-pestle, and thus completely levigated, a little  
 ‘ water being mixed with them. Make pills of them as large as tares or  
 ‘ small pulse, and keep them dry in a shady place \*.

‘ One of those pills must be swallowed morning and evening with  
 ‘ some *betel*-leaf, or, in countries where *betel* is not at hand, with cold  
 ‘ water. If the body be cleansed from foulness and obstructions by gentle  
 ‘ cathartics and bleeding, before the medicine is administered, the remedy  
 ‘ will be speedier.’

THE principal ingredient of this medicine is the *arsenic*, which the *Arabs* call *shuci*, the *Persians* *mergi mîsh*, or *monse-bane*, and the *Indians* *sau'hyu*; a mineral substance, ponderous and *crystalline*: the *orpiment*, or *yellow arsenic*, is the weaker sort. It is a deadly poison, and so subtil, that, when mice are killed by it, the very smell of the dead will destroy the living of that species. After it has been kept about seven

\* The lowest weight in general use among the *Hindus* is the *retî*, called in *Sanskrit* either *retticâ* or *raṭṭicâ*, indicating *redness*, and *crishmalâ* from *crishma*, *black*. It is the *red* and *black* seed of the *gunjâ*-plant, which is a creeper of the same class and order at least with the *glycyrrhiza*; but I take this from report, having never examined its blossoms. One *retticâ* is said to be of equal weight with three barley-corns, or four grains of rice in the husk; and eight *retî*-weights, used by jewellers, are equal to seven carats. I have weighed a number of the seeds in diamond-scales, and find the average apothecary's weight of one seed to be a grain and *five-sixteenths*. Now in the *Hindu* medical books *ten* of the *retticâ*-seeds are one *mîshâca*, and eight *mîshâca* make a *tôlâca* or *tolâ*, but in the law-books of *Bengal* a *mîshâca* consists of *sixteen raṭṭicâs*, and a *tôlâca* of *five mîshâs*, and, according to some authorities, *five retîs* only go to one *mîshâ*, *fifteen* of which make a *tôlâca*. We may observe, that the silver *retî*-weights, used by the goldsmiths at *Banâres*, are *twice* as heavy as the *retîs*, and thence it is that *eight retîs* are commonly said to constitute one *mîshâ*, that is, *eight* silver weights, or *sixteen* seeds; *eighty* of which seeds, or *105 grains*, constitute the quantity of arsenic in the *Hindu* prescription.

years, it loses much of its force; its colour becomes turbid; and its weight is diminished. This mineral is hot and dry in the fourth degree: it causes suppuration, dissolves or unites, according to the quantity given; and is very useful in closing the lips of wounds when the pain is too intense to be borne. An unguent made of it with oils of any sort, is an effectual remedy for some cutaneous disorders, and, mixed with rose-water, it is good for cold tumours, and for the dropsy; but it must never be administered without the greatest caution; for such is its power, that the smallest quantity of it in powder, drawn, like *alcohol*, between the eye-lashes, would in a single day entirely corrode the coats and humours of the eye; and fourteen *retis* of it would in the same time destroy life. The best antidote against its effects are the scrapings of leather reduced to ashes. If the quantity of arsenic taken be accurately known, four times as much of those ashes, mixed with water, and drank by the patient, will sheath and counteract the poison.

THE writer, conformably to the directions of his learned friend, prepared the medicine; and, in the same year, gave it to numbers, who were reduced by the diseases above mentioned to the point of death. GOD is his witness that they grew better from day to day, were at last completely cured, and are now living (except one or two, who died of other disorders) to attest the truth of this assertion. One of his first patients was a *Parsi*, named MENU'CHER, who had come from *Surat* to this city, and had fixed his abode near the writer's house. He was so cruelly afflicted with a confirmed lues, here called *the Persian Fire*, that his hands and feet were entirely ulcerated, and almost corroded, so that he became an object of disgust and abhorrence. This man consulted the writer on his case, the state of which he described without reserve. Some

blood was taken from him on the same day, and a cathartic administered on the next. On the third day he began to take the *arsenic pills*, and, by the blessing of God, the virulence of his disorder abated by degrees, until signs of returning health appeared: in a fortnight his recovery was complete, and he was bathed, according to the practice of our physicians. He seemed to have no virus left in his blood, and none has been since perceived by him.

BUT the power of this medicine has chiefly been tried in the cure of the *juzám*, as the word is pronounced in *India*: a disorder infecting the whole mass of blood, and thence called by some *šifādi khún*. The former name is derived from an *Arabic* root, signifying, in general, *amputation, maiming, excision*, and, particularly, the *truncation or erosion of the fingers*, which happens in the last stage of the disease. It is extremely contagious; and, for that reason, the Prophet said, *ferú mina'lmejdhámi camá teferrú mina'l ášad*, or, 'Flee from a person afflicted with the *jadhám*, as you would flee from a lion.' The author of the *Bahhru'lja-wáhir*, or *Sea of Pearls*, ranks it as an infectious malady with the *measles*, the *small-pox*, and the *plague*. It is also *hereditary*, and, in that respect, classed by medical writers with the *gout*, the *consumption*, and the *white leprosy*.

A COMMON cause of this distemper is the unwholesome diet of the natives, many of whom are accustomed, after eating a quantity of *fish*, to swallow copious draughts of *milk*, which fail not to cause an accumulation of yellow and black bile, which mingles itself with the blood and corrupts it. But it has other causes; for a *Bráhmén*, who had never tasted *fish* in his life, applied lately to the composer of this essay, and  
 appeared

appeared in the highest degree affected by a corruption of blood; which he might have inherited, or acquired by other means. Those whose religion permits them to eat *beef*, are often exposed to the danger of heating their blood intensely, through the knavery of the butchers in the *Bázár*, who fatten their calves with *Balúwer*; and those who are so ill-advised as to take *provocatives*, a folly extremely common in *India*, at first are insensible of the mischief, but, as soon as the increased moisture is dispersed, find their whole mass of blood inflamed and, as it were, adust; whence arises the disorder of which we are now treating. The *Persian* (or venereal) fire generally ends in this malady, as one DE'VI' PRASA'D, lately in the service of Mr. VANSITTART, and some others, have convinced me by an unreserved account of their several cases.

It may here be worth while to report a remarkable case, which was related to me by a man who had been afflicted with the *juzám* near four years, before which time he had been disordered with the *Persian* fire; and, having closed an ulcer by means of a strong healing plaster, was attacked by a violent pain in his joints. On this he applied to a *Cabirája*, or *Hindu* physician, who gave him some pills, with a positive assurance that the use of them would remove his pain in a few days; and in a few days it was, in fact, wholly removed; but a very short time after, the symptoms of the *juzám* appeared, which continually increased to such a degree, that his fingers and toes were on the point of dropping off. It was afterwards discovered, that the pills which he had taken were made of cinnabar, a common preparation of the *Hindus*; the heat of which had first stirred the humours, which, on stopping the external discharge, had fallen on the joints, and then had occasioned a quantity of adust bile to mix itself with the blood and infect the whole mass.

OF this dreadful complaint, however caused, the first symptoms are a numbness and redness of the whole body, and principally of the face, an impeded hoarse voice, thin hair and even baldness, offensive perspiration and breath, and whitlows on the nails. The cure is best begun with copious bleeding and cooling drink, such as a decoction of the *nilifer*, or *Nymphaea*, and of violets, with some doses of manna; after which stronger cathartics must be administered. But no remedy has proved so efficacious as the pills composed of arsenic and pepper. One instance of their effect may here be mentioned; and many more may be added, if required.

IN the month of *February*, in the year just mentioned, one *Shaikh RAMAZA'NI*, who was then an upper-servant to the Board of Revenue, had so corrupt a mass of blood, that a black leprosy of his joints was approaching; and most of his limbs began to be ulcerated: in this condition he applied to the writer, and requested immediate assistance. Though the disordered state of his blood was evident on inspection, and required no particular declaration of it, yet many questions were put to him; and it was clear from his answers that he had a confirmed *juzum*: he then lost a great deal of blood, and, after due preparation, took the arsenic-pills. After the first week his malady seemed alleviated; in the second it was considerably diminished; and in the third so entirely removed, that the patient went into the bath of health, as a token that he no longer needed a physician.

## IX.

### ON THE INDIAN GAME OF CHESS.

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BY THE PRESIDENT.

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IF evidence be required to prove that chess was invented by the *Hindus*, we may be satisfied with the testimony of the *Persians*; who, though as much inclined as other nations to appropriate the ingenious inventions of a foreign people, unanimously agree that the game was imported from the west of *India*, together with the charming fables of *VISHNUSARMAN*, in the sixth century of our era. It seems to have been immemorially known in *Hindustan* by the name of *Chaturanga*, that is, the four *angas*, or *members*, of an army, which are said in the *Amaracōṣha* to be *haṣṭyaśwaraś'hepādātani*, or *elephants, horses, chariots, and foot-soldiers*; and, in this sense, the word is frequently used by epic poets in their descriptions of real armies. By a natural corruption of the pure *Sanskrit* word, it was changed by the old *Persians* into *Chatrang*; but the *Arabs*, who soon after took possession of their country, had neither the initial nor final letter of that word in their alphabet, and consequently altered it further into *Shatranj*, which found its way presently into the modern *Persian*, and at length into the dialects of *India*, where the true derivation of the name is known only to the learned. Thus has a very significant word in the sacred language of the *Brahmans* been transformed by successive changes into *axedrez, jeuqui, échecs, chefs*; and, by a whimsical concurrence of circumstances, given birth to the *English* word *chuck*, and even a name to the *Exchequer* of *Great Britain*. The beautiful simplicity and extreme perfection of the game, as it is commonly played



played in *Europe* and *Asia*, convince me that it was invented by one effort of some great genius; not completed by gradual improvements, but formed, to use the phrase of *Italian* critics, *by the first intention*; yet of this simple game, so exquisitely contrived, and so certainly invented in *India*, I cannot find any account in the classical writings of the *Bráhmans*. It is, indeed, confidently asserted, that *Sanscrit* books on Chefs exist in this country; and, if they can be procured at *Bandres*, they will assuredly be sent to us: at present I can only exhibit a description of a very ancient *Indian* game of the same kind; but more complex, and, in my opinion, more modern than the simple Chefs of the *Persians*. This game is also called *Chaturanga*, but more frequently *Chatúráñi*, or the *four Kings*, since it is played by four persons representing as many princes, two allied armies combating on each side. The description is taken from the *Bhawiṣṭhya Purán*, in which YUDHISHÍR is represented conversing with VYÁSA, who explains, at the king's request, the form of the fictitious warfare, and the principal rules of it. "Having marked *eight* squares on all sides," says the sage, "place the *red* army to the east, the *green* to the south, the *yellow* to the west, and the *black* to the north: let the *elephant* stand on the left of the *king*; next to him the *horse*; then the *boat*; and, before them all, four *foot-soldiers*; but the *boat* must be placed in the *angle* of the board." From this passage it clearly appears, that an army, with its four *angas*, must be placed on each side of the board, since an *elephant* could not stand in any other position on the *left* hand of each *king*; and RA'DHACA'NT informed me, that the board consisted, like ours, of *sixty-four* squares, half of them occupied by the forces, and half vacant. He added, that this game is mentioned in the oldest law-books, and that it was invented by the wife of RA'VAN, king of *Lancà*, in order to amuse him

with

with an image of war, while his metropolis was closely besieged by RA'MA in the second age of the world. He had not heard the story told by FIRDAUSI near the close of the *Shúhnámah*, and it was probably carried into *Persia* from *Cányacuvja* by BORZU, the favourite physician, thence called *Vaidyapriya*, of the great ANU'SHIRAV'AN; but he said that the *Bráhmans* of *Gaur*, or *Bengal*, were once celebrated for superior skill in the game, and that his father, together with his spiritual preceptor JAGANNA'T'H, now living at *Tribéni*, had instructed two young *Bráhmans* in all the rules of it, and had sent them to *Jayanagar* at the request of the late *Rájá*, who had liberally rewarded them. A ship or boat is substituted, we see, in this complex game for the *rat'h*, or armed chariot, which the *Bengalese* pronounce *rot'h*, and which the *Persians* changed into *rokh*, whence came the *rook* of some *European* nations; as the *vierge* and *fol* of the *French* are supposed to be corruptions of *ferz* and *fil*, the *prime minister* and *elephant* of the *Persians* and *Arabs*. It were vain to seek an etymology of the word *rook* in the modern *Persian* language; for, in all the passages extracted from FIRDAUSI and JA'MI, where *rokh* is conceived to mean a *hero*, or a *fabulous bird*, it signifies, I believe, no more than a *cheek* or a *face*; as in the following description of a procession in *Egypt*: "When a thousand youths, like cypresses, box-trees, and firs, with locks as fragrant, cheeks as fair, and bosoms as delicate as lilies of the valley, were marching gracefully along, thou wouldst have said that the new spring was turning his face (not as HYDE translates the words, carried on *rokhs*) from station to station;" and, as to the battle of the *duwázdeh rokh*, which D'HERBELOT supposes to mean *douze preux chevaliers*, I am strongly inclined to think that the phrase only signifies a combat of twelve persons face to face, or six on a side. I cannot agree with my friend RA'DHA'CAN'T, that a ship is properly introduced

in this imaginary warfare instead of a *chariot*, in which the old *Indian* warriors constantly fought ; for, though the *king* might be supposed to fit in a *car*, so that the four *angas* would be complete, and though it may often be necessary in a real campaign to pass rivers or lakes, yet no river is marked on the *Indian* as it is on the *Chinese* chess-board ; and the intermixture of ships with horses, elephants, and infantry embattled on a plain, is an absurdity not to be defended. The use of *dice* may, perhaps, be justified in a representation of war, in which *fortune* has unquestionably a great share ; but it seems to exclude chess from the rank which has been assigned to it among the sciences, and to give the game before us the appearance of *whist*, except that pieces are used openly, instead of cards which are held concealed. Nevertheless, we find that the moves in the game described by VYASA were to a certain degree regulated by *chance* ; for he proceeds to tell his royal pupil, that, “ if *cinque* be thrown, the *king* or a *parwn* must be moved ; if *quatre*, the *elephant* ; if *trois*, the *horse* ; and if *deux*, the *boat*.”

He then proceeds to the moves : “ the *king* passes freely on all sides but over *one* square only ; and with the same limitation the *parwn* moves, but he advances straight forward and kills his enemy through an angle ; the *elephant* marches in all directions as far as his driver pleases ; the *horse* runs obliquely, traversing three squares ; and the *ship* goes over two squares diagonally.” The elephant, we find, has the powers of our *queen*, as we are pleased to call the *minister*, or *general* of the *Persians* ; and the *ship* has the motion of the piece to which we give the unaccountable appellation of *bishop*, but with a restriction which must greatly lessen his value.

THE bard next exhibits a few general rules and superficial directions for the conduct of the game. “ The *pawns* and the *ship* both kill and may “ be voluntarily killed ; while the *king*, the *elephant*, and the *horse*, may “ slay the foe, but cannot expose themselves to be slain. Let each player “ preserve his own forces with extreme care, securing his *king* above “ all, and not sacrificing a superior to keep an inferior piece.” Here the commentator on the *Purân* observes, that the *horse*, who has the choice of *eight* moves from any central position, must be preferred to the *ship*, who has only the choice of *four* ; but this argument would not have equal weight in the common game, where the *bishop* and *tower* command a whole line, and where a knight is always of less value than a tower in action, or the bishop of that side on which the attack is begun. “ It is by the overbearing power of the *elephant* that the king “ fights boldly ; let the whole army, therefore, be abandoned, in order “ to secure the *elephant* : the king must never place one elephant before “ another, according to the rule of GO'TAMA, unless he be compelled “ by want of room, for he would thus commit a dangerous fault ; and, if “ he can slay one of two hostile elephants, he must destroy that on his “ left hand.” The last rule is extremely obscure ; but, as GO'TAMA was an illustrious lawyer and philosopher, he would not have condescended to leave directions for the game of *Chaturanga*, if it had not been held in great estimation by the ancient sages of *India*.

ALL that remains of the passage which was copied for me by RA'D-HIA'CANT and explained by him, relates to the several modes in which a partial success or complete victory may be obtained by any one of the four players ; for we shall see that, as if a dispute had arisen between two allies, one of the kings may assume the command of all the forces,

and aim at separate conquest. First, "When any one king has placed himself on the square of another king, which advantage is called *Simhâ-jana*, or *the throne*, he wins a stake, which is doubled, if he kills the adverse monarch when he seizes his place; and, if he can seat himself on the throne of his ally, he takes the command of the whole army." Secondly, "If he can occupy successively the thrones of all three princes, he obtains the victory, which is named *Chatûrâjî*, and the stake is doubled if he kills the last of the three just before he takes possession of his throne; but, if he kills him on his throne, the stake is quadrupled." Thus, as the commentator remarks, in a real warfare, a king may be considered as victorious when he seizes the metropolis of his adversary; but, if he can destroy his foe, he displays greater heroism, and relieves his people from any further solicitude. "Both in gaining the *Simhâjana* and the *Chatûrâjî*, says VYĀSA the king must be supported by the *elephants*, or by all the forces united." Thirdly, "When one player has his own king on the board, but the king of his partner has been taken, he may replace his captive ally if he can seize both the adverse kings; or, if he cannot effect their capture, he may exchange his king for one of them against the general rule, and thus redeem the allied prince, who will supply his place." This advantage has the name of *Nripâcrishṭa*, or *recovered by the king*, and the *Naucâcrishṭa* seems to be analogous to it, but confined to the case of *ships*. Fourthly, "If a pawn can march to any square on the opposite extremity of the board except that of the king, or that of the ship, he assumes whatever power belonged to that square; and this promotion is called *Shat-pada*, or the *six strides*." Here we find the rule, with a singular exception concerning the advancement of *pawns*, which often occasions a most interesting struggle at our common chess, and which has furnished the poets

poets and moralists of *Arabia* and *Persia* with many lively reflections on human life. It appears that "this privilege of *Shat'pada* was not allowable, " in the opinion of Go'TAMA, when a player had three pawns on the " board ; but when only one pawn and one ship remained, the pawn might " advance even to the square of a king or a ship, and assume the power " of either." Fifthly, " According to the *Râcshafas*, or *g.mts* (that " is, the people of *Lancà*, where the game was invented) there could be " neither victory nor defeat if a king were left on the plain without force : " a situation which they named *Câcaci'sht'ha*." Sixthly, " If three ships " happen to meet, and the fourth ship can be brought up to them in the " remaining angle, this has the name of *Vrihamaucà* ; and the player of " the fourth seizes all the others." Two or three of the remaining couplets are so dark, either from an error in the manuscript or from the antiquity of the language, that I could not understand the *Pandit's* explanation of them, and suspect that they gave even him very indistinct ideas ; but it would be easy, if it were worth while to play at the game by the preceding rules, and a little practice would perhaps make the whole intelligible. One circumstance in this extract from the *Purân* seems very surprising : all games of hazard are positively forbidden by MENU, yet the game of *Chaturanga*, in which dice are used, is taught by the great VYAS'A himself, whose law-tract appears with that of Go'TAMA among the eighteen books which form the *Dharmasûtra* ; but as RA'DHA'CANT and his preceptor JAGANNA'I'H are both employed by government in compiling a Digest of *Indian Laws*, and as both of them, especially the venerable Sage of *Tribèni*, understand the game, they are able, I presume, to assign reasons why it should have been excepted from the general prohibition, and even openly taught by ancient and modern *Brâhmans*.



## X.

### TWO INSCRIPTIONS FROM THE VINDHYA MOUNTAINS.

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TRANSLATED FROM THE SANSKRIT  
BY CHARLES WILKINS, ESQ.

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FIRST INSCRIPTION, IN A CAVERN, CALLED THE GROT OF THE  
RISHIS, NEAR GAYA.

1. **A**NANTA VARMA, master of the hearts of the people, who was the good son of *Sree* SARDOOLA, by his own birth and great virtues classed amongst the principal rulers of the earth, gladly caused this statue of KREESHNA, of unfulfilled renown, confirmed in the world like his own reputation and the image of KANTEEMATEE \*, to be deposited in this great mountain-cave.

2. *SREE* SARDOOLA, of established fame, jewel of the diadems of kings, emblem of time to the martial possessors of the earth, to the submissive the tree of the fruit of desire, a light to the Military Order, whose glory was not founded upon the feats of a single battle, the ravisher of female hearts and the image of SMARA †, became the ruler of the land.

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\* RADHA, the favourite mistress of KREESHNA.

† KAMA DEVA the *Cupid* of the *Hindoo*s.



3. WHEREVER *Sree* SARDOOLA is wont to cast his own discordant sight towards a foe, and the fortunate star, his broad eye is enflamed with anger between its expanded lids; *there* falleth a shower of arrows from the ear-drawn firing of the bow of his son, the renowned ANANTA VARMA, the bestower of infinite happiness.

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SECOND INSCRIPTION, IN A CAVE BEHIND NAGARJENI.

1. THE auspicious *Sree* YAJNA VARMA, whose movement was as the sportive elephant's in the season of lust, was, like MANOO \*, the appointer of the military station of all the chiefs of the earth.—By whose divine offerings, the God with a thousand eyes † being constantly invited, the emaciated *Porwomee* ‡, for a long time sullied the beauty of her cheeks with falling tears.

2. ANANTA VARMA by name, the friend of strangers; renowned in the world in the character of valour; by nature immaculate as the lunar beams, and who is the offspring of *Sree* SARDOOLA:—By him this wonderful statue of BHOOTAPATEE and of DEVEE ||, the maker of all things visible and invisible and the granter of boons, which hath taken sanctuary in this cave, was caused to be made. May it protect the universe!

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\* The first legislator of the *Ilindas*.

† *Ēndā* a deification of the Heavens.

‡ The wife of *Ēndā*.

|| *Śevā*, or *Mahadevā* and his consort in one image, as a type of the deities, *Genitor* and *Genitrix*.

3. THE string of his expanded bow, charged with arrows, and drawn to the extremity of the shoulder, bursteth the circle's centre. Of spacious brow, propitious distinction, and surpassing beauty, he is the image of the moon with an undiminished countenance. ANANTA VARMA to the end! Of form like SMARA \* in existence, he is seen with the constant and affectionate, standing with their tender and fascinated eyes constantly fixed upon him.

4. FROM the machine his bow, reproacher of the crying *Koorara* †, bent to the extreme, he is endued with force; from his expanded virtue he is a provoker; by his good conduct his renown reacheth to afar; he is a hero by whose courting steeds the elephant is disturbed, and a youth who is the feat of sorrow to the women of his foes. He is the director, and his name is ANANTA ‡.

\* The Hindoo *Cupid*.

† A bird that is constantly making a noise before rain.

‡ This word signifies eternal or infinite.



## XI.

### A DESCRIPTION OF ASAM, BY MOHAMMED CAZIM,

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TRANSLATED FROM THE PERSIAN

BY HENRY VANSITTART, ESQ.\*

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**A** SAM, which lies to the north-east of *Bengal*, is divided into two parts by the river *Brahmaputra*, that flows from *Khatû*. The northern portion is called *Uttarcul*, and the southern *Dacshincul*. *Uttarcul* begins at *Gowahutty*, which is the boundary of his Majesty's territorial possessions, and terminates in mountains inhabited by a tribe called *Meeri Mechmi*. *Dacshincul* extends from the village *Sidea* to the hills of *Srinagar*. The most famous mountains to the northward of *Uttarcul* are those of *Duleh* and *Landah*; and to the southward of *Dacshincul* are those of *Namrup* (*Câmrup*?) situated four days journey above *Ghergong*, to which the *Râjâ* retreated. There is another chain of hills, which is inhabited by a tribe called *Nanac*, who pay no revenue to the *Râjâ*, but profess allegiance to him, and obey a few of his orders. But the † *Zemleh* tribe are entirely independent of him, and, whenever they find an opportunity, plunder the country contiguous to their mountains. *Afâm* is of an oblong figure: its length is about 200 standard cofs, and its breadth, from the northern to the southern mountains, about eight days journey. From *Gowahutty* to *Ghergong* are seventy-five

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\* This account of *Afâm* was translated for the Society, but afterwards printed by the learned translator as an appendix to his *Adlenginâmah*. It is reprinted here, because our government has an interest in being as well acquainted as possible with all the nations bordering on the British territories.

† In another copy this tribe are called *Dusteh*.

standard cofs; and from thence it is fifteen days journey to *Khoten*, which was the residence of *Peeran Wifch* \*, but is now called *Ava* †, and is the capital of the *Rájá* of *Pegu*, who considers himself of the posterity of that famous General. The first five days journey from the mountains of *Cámpop* is performed through forests and over hills, which are arduous and difficult to pass. You then travel eastward to *Ava* through a level and smooth country. To the northward is the plain of *Khalà*, that has been before mentioned as the place from whence the *Brahmaputra* issues, which is afterwards fed by several rivers that flow from the southern mountains of *Afán*. The principal of these is the *Dhoner*, which has before occurred in this history. It joins that broad river at the village *Luckeigereh*.

BETWEEN these rivers is an island well inhabited, and in an excellent state of tillage. It contains a spacious, clear, and pleasant country, extending to the distance of about fifty cofs. The cultivated track is bounded by a thick forest, which harbours elephants, and where those animals may be caught, as well as in four or five other forests of *Afán*. If there be occasion for them, five or six hundred elephants may be procured in a year. Across the *Dhoner*, which is the side of *Ghergong*, is a wide, agreeable, and level country, which delights the heart of the beholder. The whole face of it is marked with population and tillage; and it presents on every side charming prospects of ploughed fields, har-

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\* According to *Khondemir*, *Peeran Wifch* was one of the nobles of *Afrasiab*, King of *Tinàn*, contemporary with *Kaicau*, second prince of the *Kiaman* dynasty. In the *Fokung Jehangeery* and *Borhaun Kated* (two Persian Dictionaries) *Peeran* is described as one of the *Pehlavan* or heroes of *Tinàn*, and General under *Afrasiab*, the name of whose father was *Wifch*.

† This is a palpable mistake. *Khoten* lies to the north of *Himaláya*; and *Phàn F'jah* could never have seen *Ava*.

vests, gardens, and groves. All the island before described lies in *Dacshinul*. From the village *Selagerch* to the city of *Ghergong*, is a space of about fifty cofs, filled with such an uninterrupted range of gardens, plentifully stocked with fruit-trees, that it appears as one garden. Within them are the houses of the peasants, and a beautiful assemblage of coloured and fragrant herbs, and of garden and wild flowers blowing together. As the country is overflowed in the rainy season, a high and broad causeway has been raised for the convenience of travellers from *Selagerch* to *Ghergong*, which is the only uncultivated ground that is to be seen. Each side of this road is planted with shady bamboos, the tops of which meet, and are intertwined. Amongst the fruits which this country produces, are mangoes, plantains, jacks, oranges, citrons, limes, pine-apples, and *punialeh*, a species of *amleh*, which has such an excellent flavour, that every person who tastes it prefers it to the plum. There are also cocoa-nut trees, pepper-vines, *Areca*-trees, and the *Sadjj*\*, in great plenty. The sugar-cane excels in softness and sweetness, and is of three colours, red, black, and white. There is ginger free from fibres, and betel-vines. The strength of vegetation and fertility of the soil are such, that whatever seed is sown, or slips planted, they always thrive. The environs of *Ghergong* furnish small apricots, yams, and pomegranates; but as these articles are wild, and not assisted by cultivation and engraftment, they are very indifferent. The principal crop of this country consists in rice and *masli*†. *Adis* is very scarce, and wheat and barley are never sown. The silks are excellent, and resemble

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\* The *Sady* is a long aromatic leaf, which has a pungent taste, and is cited in *Sanscrit Icar-pana*. In our botanical books it bears the name of *Malabathrum*, or the *Indian leaf*.

† *Masli* is a species of grain, and *Ades* a kind of pea.

those of *China*; but they manufacture very few more than are required for use. They are successful in embroidering with flowers, and in weaving velvet and *tantbund*, which is a species of silk of which they make tents and *kenauts*\*. Salt is a very precious and scarce commodity: it is found at the bottom of some of the hills; but of a bitter and pungent quality. A better sort is in common use, which is extracted from the plantain-tree. The mountains, inhabited by the tribe called *Nanac*, produce plenty of excellent *Lignum Aloes*, which a society of the natives imports every year into *Asam*, and barter for salt and grain. This evil-disposed race of mountaineers are many degrees removed from the line of humanity, and are destitute of the characteristic properties of a man. They go naked from head to foot, and eat dogs, cats, snakes, mice, rats, ants, locusts, and every thing of this sort which they can find. The hills of *Camrup*, *Sidea*, and *Luckigereh*, supply a fine species of *Lignum Aloes*, which sinks in water. Several of the mountains contain musk-deer.

The country of *Uttarcul*, which is on the northern side of the *Brahmaputra*, is in the highest state of cultivation, and produces plenty of pepper and *Areca*-nuts. It even surpasses *Dacshincul* in population and tillage; but, as the latter contains a greater track of wild forests, and places difficult of access, the rulers of *Asam* have chosen to reside in it for the convenience of control, and have erected in it the capital of the kingdom. The breadth of *Uttarcul*, from the bank of the river to the foot of the mountains, which is a cold climate, and contains snow, is various, but is nowhere less than fifteen coss, nor more than forty-five coss. The

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\* *Kenauts* are walls made to surround tents.

inhabitants of those mountains are strong, have a robust and respectable appearance, and are of a middling size. Their complexions, like those of the natives of all cold climates, are red and white; and they have also trees and fruits peculiar to frigid regions. Near the fort of *Jum Dereh*, which is on the side of *Gowahutty*, is a chain of mountains, called the country of *Dereng*, all the inhabitants of which resemble each other in appearance, manners, and speech, but are distinguished by the names of their tribes and places of residence. Several of these hills produce musk, *kataus*\*, *bhoat*†, *peree*, and two species of horses, called *goont* and *tanyans*. Gold and silver are procured here, as in the whole country of *Asam*, by washing the sand of the rivers. This, indeed, is one of the sources of revenue. It is supposed that 12,000 inhabitants, and some say 20,000, are employed in this occupation; and it is a regulation, that each of these persons shall pay a fixed revenue of a *tólà*‡ of gold to the *Rájá*. The people of *Asam* are a base and unprincipled nation, and have no fixed religion. They follow no rule but that of their own inclinations, and make the approbation of their own vicious minds the test of the propriety of their actions. They do not adopt any mode of worship practised either by *Heathens* or *Mohammedans*; nor do they concur with any of the known sects which prevail amongst mankind. Unlike the *Pagans* of *Hindustàn*, they do not reject victuals which have been dressed by *Miselmans*; and they abstain from no flesh except hu-

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\* *Kataus* is thus described in the *Borhaun Kataa*: “This word, in the language of *Rùm*, is a “sea-cow; the tail of which is hung upon the necks of horses, and on the summit of standards. Some say that it is a cow which lives in the mountains of *Khatà*.” It here means the mountain-cow, which supplies the tail that is made into *charuies*; and in *Sanseet* is called *chámara*.

† *Bhoat* and *peree* are two kinds of blanket.

‡ Eighty *retis*-weights. See page 154, note.



man. They even eat animals that have died a natural death; but, in consequence of not being used to the taste of ghee, they have such an antipathy to this article, that if they discover the least smell of it in their victuals, they have no relish for them. It is not their custom to veil their women; for even the wives of the *Rájá* do not conceal their faces from any person. The females perform work in the open air, with their countenances exposed and heads uncovered. The men have often four or five wives each, and publicly buy, sell, and change them. They shave their heads, beards, and whiskers, and reproach and admonish every person who neglects this ceremony. Their language has not the least affinity with that of *Bengal*\*. Their strength and courage are apparent in their looks; but their ferocious manners and brutal tempers are also betrayed by their physiognomy. They are superior to most nations in corporal force and hardy exertions. They are enterprising, savage, fond of war, vindictive, treacherous, and deceitful. The virtues of compassion, kindness, friendship, sincerity, truth, honour, good faith, shame, and purity of morals, have been left out of their composition. The seeds of tenderness and humanity have not been sown in the field of their frames. As they are destitute of the mental garb of manly qualities, they are also deficient in the dress of their bodies. They tie a cloth round their heads, and another round their loins, and throw a sheet upon their shoulder; but it is not customary in that country to wear turbans, robes, drawers, or shoes. There are no buildings of brick or stone, or with walls of earth, except the gates of the city of *Ghergong*, and some of their idolatrous temples. The rich and poor construct their habita-

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\* This is an error; young *Báhmens* often come from *Ajam* to *Nadiya* for instruction; and their vulgar dialect is understood by the *Bengal* teachers.

tions of wood, bamboos, and straw. The *Rájá* and his courtiers travel in stately litters; but the opulent and respectable persons amongst his subjects are carried in lower vehicles, called doolies. *Asám* produces neither horses\*, camels, nor asses; but those cattle are sometimes brought thither from other countries. The brutal inhabitants, from a congenial impulse, are fond of seeing and keeping asses, and buy and sell them at a high price; but they discover the greatest surprize at seeing a camel; and are so afraid of a horse, that if one trooper should attack a hundred armed *Afamians*, they would all throw down their arms and flee, or, should they not be able to escape, they would surrender themselves prisoners. Yet, should one of that detestable race encounter two men of another nation on foot, he would defeat them.

The ancient inhabitants of this country are divided into two tribes, the *Afamians* and the *Cultanians*. The latter excel the former in all occupations except war and the conduct of hardy enterprises, in which the former are superior. A body-guard of six or seven thousand *Afamians*, fierce as demons, of unshaken courage, and well provided with warlike arms and accoutrements, always keep watch near the *Rájá's* sitting and sleeping apartments; these are his loyal and confidential troops and patrol. The martial weapons of this country are the musquet, sword, spear, and arrow and bow of bamboo. In their forts and boats they have also plenty of cannon, *zerbzen*† and *amchangee*, in the management of which they are very expert.

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\* As the Author has asserted that two species of horses, called *goont* and *tanyans*, are produced in *Dereng*, we must suppose that this is a different country from *Asám*.

† Swivels.

WHENEVER any of the *Rájás*, magistrates, or principal men die, they dig a large cave for the deceased, in which they inter his women, attendants, and servants, and some of the magnificent equipage and useful furniture which he possessed in his life-time, such as elephants, gold and silver, *bádcah* (large fans) carpets, clothes, victuals, lamps, with a great deal of oil, and a torch-bearer; for they consider those articles as stores for a future state. They afterwards construct a strong roof over the cave upon thick timbers. The people of the army entered some of the old caves, and took out of them the value of 90,000 rupees, in gold and silver. But an extraordinary circumstance is said to have happened, to which the mind of man can scarcely give credit, and the probability of which is contradicted by daily experience. It is this: All the Nobles came to the Imperial General, and declared, with universal agreement, that a golden betel-stand was found in one of the caves that was dug eighty years before, which contained betel-leaf quite green and fresh; but the authenticity of this story rests upon report.

GHERGONG has four gates, constructed of stone and earth; from each of which the *Rájá's* palace is distant three cofs. The city is encompassed with a fence of bamboos, and within it high and broad causeways have been raised for the convenience of passengers during the rainy season. In the front of every man's house is a garden, or some cultivated ground. This is a fortified city, which encloses villages and tilled fields. The *Rájá's* palace stands upon the bank of the *Degoo*, which flows through the city. This river is lined on each side with houses, and there is a small market which contains no shopkeepers except sellers of betel. The reason is, that it is not customary for the inhabitants to buy provisions for daily use, because they lay up a stock for themselves,

selves, which lasts them a year. The *Rājā*'s palace is surrounded by a causeway, planted on each side with a close hedge of bamboos, which serves instead of a wall. On the outside there is a ditch, which is always full of water. The circumference of the enclosure is one coss and fourteen jerebs. Within it have been built lofty halls and spacious apartments for the *Rājā*, most of them of wood, and a few of straw, which are called *chuppers*. Amongst these is a *dirwān khānah*, or public saloon, one hundred and fifty cubits long, and forty broad, which is supported by sixty-six wooden pillars, placed at an interval of about four cubits from each other. The *Rājā*'s seat is adorned with lattice-work and carving. Within and without have been placed plates of brass, so well polished, that when the rays of the sun strike upon them they shine like mirrors. It is an ascertained fact, that 3,000 carpenters and 12,000 labourers were constantly employed in this work during two years before it was finished. When the *Rājā* sits in this chamber, or travels, instead of drums and trumpets, they beat the \* *dhōl* and *dund*. The latter is a round and thick instrument made of copper, and is certainly the same as the drum †, which it was customary in the time of the ancient kings to beat in battles and marches.

THE *Rājās* of this country have always raised the crest of pride and vainglory, and displayed an ostentatious appearance of grandeur, and a numerous train of attendants and servants. They have not bowed the head of submission and obedience, nor have they paid tribute or revenue to the most powerful monarch; but they have curbed the ambition and

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\* The *dhōl* is a kind of drum, which is beaten at each end.

† This is a kind of kettle-drum, and is made of a composition of several metals.

checked the conquests of the most victorious princes of *Hindustân*. The solution of the difficulties attending a war against them, has baffled the penetration of heroes, who have been stiled Conquerors of the World. Whenever an invading army has entered their territories, the *Afami*ans have covered themselves in strong posts, and have distressed the enemy by stratagems, surprises, and alarms, and by cutting off their provisions. If these means have failed, they have declined a battle in the field, but have carried the peasants into the mountains, burnt the grain, and left the country empty. But when the rainy season has set in upon the advancing enemy, they have watched their opportunity to make excursions and vent their rage; the famished invaders have either become their prisoners or been put to death. In this manner powerful and numerous armies have been sunk in that whirlpool of destruction, and not a soul has escaped.

FORMERLY, HUSAIN SH'AH, a king of *Bengal*, undertook an expedition against *Afām*, and carried with him a formidable force in cavalry, infantry, and boats. The beginning of this invasion was crowned with victory. He entered the country, and erected the standard of superiority and conquest. The *Rājā* being unable to encounter him in the field, evacuated the plains, and retreated to the mountains. HUSAIN left his son with a large army to keep possession of the country, and returned to *Bengal*. The rainy season commenced, and the roads were shut up by the inundation. The *Rājā* descended from the mountains, surrounded the *Bengal* army, skirmished with them, and cut off their provisions, till they were reduced to such straits, that they were all in a short time either killed or made prisoners.

IN the same manner MOHAMMED *Sháh*, the son of TOGLUC *Sháh*, who was king of several of the provinces of *Hinduistán*, sent a well-appointed army of a hundred thousand cavalry to conquer *Asám*; but they were all devoted to oblivion in that country of enchantment; and no intelligence or vestige of them remained. Another army was dispatched to revenge this disaster; but when they arrived in *Bengal*, they were panic-struck, and shrunk from their enterprize; because if any person passes the frontier into that district, he has not leave to return. In the same manner, none of the inhabitants of that country are able to come out of it; which is the reason that no accurate information has hitherto been obtained relative to that nation. The natives of *Hinduistán* consider them as wizards and magicians, and pronounce the name of that country in all their incantations and counter-charms. They say, that every person who sets his foot there is under the influence of witchcraft, and cannot find the road to return.

JEIDEJ SING \*, the *Rájá* of *Asám*, bears the title of *Swergí*, or *Celestial*. *Swerg*, in the *Hinduistání* language, means heaven. That frantic and vainglorious prince is so excessively foolish and mistaken, as to believe that his vicious ancestors were sovereigns of the heavenly host, and that one of them being inclined to visit the earth, descended by a golden ladder. After he had been employed some time in regulating and governing his new kingdom, he became so attached to it, that he fixed his abode in it, and never returned.

IN short, when we consider the peculiar circumstances of *Asám*; that

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\* Properly *Jayadhwaja Sinha*, or the *Lion with Banners of Conquest*.

the country is spacious, populous, and hard to be penetrated; that it abounds in perils and dangers; that the paths and roads are beset with difficulties; that the obstacles to the conquest of it are more than can be described; that the inhabitants are a savage race, ferocious in their manners, and brutal in their behaviour; that they are of a gigantic appearance, enterprising, intrepid, treacherous, well armed, and more numerous than can be conceived; that they resist and attack the enemy from secure posts, and are always prepared for battle; that they possess forts as high as heaven, garrisoned by brave soldiers, and plentifully supplied with warlike stores, the reduction of each of which would require a long space of time; that the way was obstructed by thick and dangerous bushes, and broad and boisterous rivers: when we consider these circumstances, we shall wonder that this country, by the aid of God and the auspices of his Majesty, was conquered by the imperial army, and became a place for erecting the standard of the faith. The haughty and insolent heads of several of the detestable *Asumians*, who stretch the neck of pride, and who are devoid of religion and remote from God, were bruised by the hoofs of the horses of the victorious warriors. The *Musselman* heroes experienced the comfort of fighting for their religion; and the blessings of it reverted to the sovereignty of his just and pious Majesty.

The *Ra'â*, whose soul had been enslaved by pride, and who had been bred up in the habit of presuming on the stability of his own government, never dreamt of this reverse of fortune; but being now overtaken by the punishment due to his crimes, fled, as has been before mentioned, with some of his nobles, attendants, and family, and a few of his effects, to the mountains of *Câmri-p*. That spot, by its bad air and  
water,

water, and confined space, is rendered the worst place in the world, or rather, it is one of the pits of hell. The *Rājā's* officers and soldiers, by his orders crossed the *Dhoree*, and settled in the spacious island between that and the *Brahmaputra*, which contains numerous forests and thickets. A few took refuge in other mountains, and watched an opportunity of committing hostilities.

CA'MRUP is a country on the side of *Dachinul*, situated between three high mountains, at the distance of four days journey from *Ghergong*. It is remarkable for bad water, noxious air, and confined prospects. Whenever the *Rājā* used to be angry with any of his subjects, he sent them thither. The roads are difficult to pass, inasmuch that a foot-traveller proceeds with the greatest inconvenience. There is one road wide enough for a horse, but the beginning of it contains thick forests for about half a coss. Afterwards there is a defile, which is stony and full of water. On each side is a mountain towering to the sky.

THE Imperial General remained some days in *Ghergong*, where he was employed in regulating the affairs of the country, encouraging the peasants, and collecting the effects of the *Rājā*. He repeatedly read the *Khotkeh*, or prayer, containing the name and titles of the Prince of the Age, King of Kings, ALEMGEER, Conqueror of the World, and adorned the faces of the coins with the imperial impression. At this time there were heavy showers, accompanied with violent wind, for two or three days; and all the signs appeared of the rainy season, which in that country sets in before it does in *Hindhustan*. The General exerted himself in establishing posts and fixing guards for keeping open the roads, and supplying the army with provisions. He thought now of securing himself during the rains; and determined, after the sky should be cleared from  
the



the clouds, the lightning cease to illuminate the air, and the swelling of the water should subside, that the army should again be set in motion against the *Rājā* and his attendants, and be employed in delivering the country from the evils of their existence.

THE Author then mentions several skirmishes which happened between the *Rājā's* forces and the imperial troops, in which the latter were always victorious. He concludes thus:—

“ At length all the villages of *Dacshinul* fell into the possession of the imperial army. Several of the inhabitants and peasants, from the diffusion of the fame of his Majesty's kindness, tenderness, and justice, submitted to his government, and were protected in their habitations and property. The inhabitants of *Uttarcul* also became obedient to his commands. His Majesty rejoiced when he heard the news of this conquest, and rewarded the General with a costly dress, and other distinguishing marks of his favour.”

THE narrative to which this is a supplement, gives a concise history of the military expedition into *Ajām*. In this description the Author has stopt at a period when the imperial troops had possessed themselves of the capital, and were masters of any part of the plain country which they chose to occupy or over-run. The sequel diminishes the credit of the conquest, by showing that it was temporary, and that the *Rājā* did not forget his usual policy of harassing the invading army during the rainy season: but this conduct produced only the effect of distressing and disgusting it with the service, instead of absolutely destroying it, as his predecessors had destroyed former adventurers. Yet the conclusion of this

war

war is far from weakening the panegyric which the Author has passed upon the Imperial General, to whom a difference of situation afforded an opportunity of displaying additional virtues, and of closing that life with heroic fortitude, which he had always hazarded in the field with martial spirit. His name and titles were *Mir JUMLEH*, *MOAZZIM Khán*, *Kháni*, *Khánán*, *Sipáhi SA'LA'R*.

## R E M A R K.

THE preceding account of the *Assamians*, who are probably superior in all respects to the *Mogáls*, exhibits a specimen of the black malignity and frantic intolerance with which it was usual, in the reign of *AURANGZIB*, to treat all those whom the crafty, cruel, and avaricious Emperor was pleased to condemn as infidels and barbarians.



## XII.

### ON THE MANNERS, RELIGION, AND LAWS OF THE CU'CTS, OR MOUNTAINEERS OF TIPRA.

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COMMUNICATED IN PERSIAN  
BY JOHN RAWLINS, ESQ.

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THE inhabitants of the mountainous districts to the east of *Bengal*, give the name of PA'TIYA'N to the Being who created the universe; but they believe that a Deity exists in every tree, that the Sun and Moon are Gods, and that, whenever they worship those subordinate divinities, PA'TIYA'N is pleased.

If any one among them put another to death, the chief of the tribe, or other persons, who bear no relation to the deceased, have no concern in punishing the murderer; but, if the murdered person has a brother, or other heir, he may take blood for blood; nor has any man whatever a right to prevent or oppose such retaliation.

WHEN a man is detected in the commission of theft or other atrocious offence, the chieftain causes a recompense to be given to the complainant, and reconciles both parties; but the chief himself receives a customary fine; and each party gives a feast of pork, or other meat, to the people of his respective tribe.

IN ancient times it was not a custom among them to cut off the heads of the women whom they found in the habitations of their enemies;

but it happened once that a woman asked another, why she came so late to her business of sowing grain: she answered, that her husband was gone to battle, and that the necessity of preparing food and other things for him had occasioned her delay. This answer was overheard by a man at enmity with her husband; and he was filled with resentment against her, considering, that, as she had prepared food for her husband for the purpose of sending him to battle against his tribe, so in general, if women were not to remain at home, their husbands could not be supplied with provision, and consequently could not make war with advantage. From that time it became a constant practice to cut off the heads of the enemy's women, especially if they happen to be pregnant, and therefore confined to their houses; and this barbarity is carried so far, that if a *Cúci* assail the house of an enemy and kill a woman with child, so that he may bring two heads, he acquires honour and celebrity in his tribe, as the destroyer of two foes at once.

As to the marriages of this wild nation; when a rich man has made a contract of marriage, he gives four or five head of *gayáls* (the cattle of the mountains) to the father and mother of the bride, whom he carries to his own house: her parents then kill the *gayáls*, and, having prepared fermented liquors and boiled rice, with other eatables, invite the father, mother, brethren, and kindred of the bridegroom to a nuptial entertainment. When a man of small property is inclined to marry, and a mutual agreement is made, a similar method is followed in a lower degree; and a man may marry any woman, except his own mother. If a married couple live cordially together, and have a son, the wife is fixed and irremovable; but if they have no son, and especially if they live together on bad terms, the husband may divorce his wife, and marry another woman.

THEY

THEY have no idea of heaven or hell, the reward of good, or the punishment of bad actions; but they profess a belief that, when a person dies, a certain spirit comes and seizes his soul, which he carries away; and that whatever the spirit promises to give at the instant when the body dies, will be found and enjoyed by the dead; but that, if any one should take up the corse and carry it off, he would not find the treasure.

THE food of this people consists of elephants, hogs, deer, and other animals; of which, if they find the carcases or limbs in the forests, they dry them, and eat them occasionally.

WHEN they have resolved on war, they send spies before hostilities are begun, to learn the stations and strength of the enemy, and the condition of the roads; after which they march in the night; and two or three hours before day-light, make a sudden assault with swords, lances, and arrows. If their enemies are compelled to abandon their station, the assailants instantly put to death all the males and females who are left behind, and strip the houses of all their furniture; but, should their adversaries, having gained intelligence of the intended assault, be resolute enough to meet them in battle, and should they find themselves over-matched, they speedily retreat, and quietly return to their own habitations. If at any time they see a star very near the moon, they say, ‘to-night we shall undoubtedly be attacked by some enemy;’ and they pass that night under arms with extreme vigilance. They often lie in ambush in a forest, near the path where their foes are used to pass and repass, waiting for the enemy with different sorts of weapons, and killing every man or woman who happens to pass by. In this situation, if a leech, or a worm, or a snake, should bite one of them, he bears the pain in perfect silence;

silence; and whoever can bring home the head of an enemy which he has cut off, is sure to be distinguished and exalted in his nation. When two hostile tribes appear to have equal force in battle, and neither has hopes of putting the other to flight, they make a signal of pacific intentions, and, sending agents reciprocally, soon conclude a treaty; after which they kill several head of *gayáls*, and feast on their flesh, calling on the Sun and Moon to bear witness of the pacification: but if one side, unable to resist the enemy, be thrown into disorder, the vanquished tribe is considered as tributary to the victors; who every year receive from them a certain number of *gayáls*, wooden dishes, weapons, and other acknowledgements of vassalage. Before they go to battle they put a quantity of roasted *dlus* (esculent roots like *potatoes*): and paste of rice-flour into the hollow of bamboos, and add to them a provision of dry rice, with some leathern bags full of liquor. Then they assemble, and march with such celerity, that in one day they perform a journey ordinarily made by letter-carriers in three or four days, since they have not the trouble and delay of dressing victuals. When they reach the place to be attacked, they surround it in the night, and at early dawn enter it, putting to death both young and old, women and children, except such as they chuse to bring away captive. They put the heads which they cut off into leathern bags; and if the blood of their enemies be on their hands, they take care not to wash it off. When, after this slaughter, they take their own food, they thrust a part of what they eat into the mouths of the heads which they have brought away, saying to each of them, ‘Eat, quench thy thirst, and satisfy thy appetite: as thou hast been slain by my hand, so may thy kinsmen be slain by my kinsmen!’ During their journey they have usually two such meals; and every watch, or two watches, they

they send intelligence of their proceedings to their families. When any one of them sends word that he has cut off the head of an enemy, the people of his family, whatever be their age or sex, express great delight, making caps and ornaments of red and black ropes; then filling some large vessels with fermented liquors, and decking themselves with all the trinkets they possess, they go forth to meet the conqueror, blowing large shells, and striking plates of metal, with other rude instruments of music. When both parties are met they show extravagant joy, men and women dancing and singing together; and if a married man has brought an enemy's head, his wife wears a head-dress with gay ornaments, the husband and wife alternately pour fermented liquor into each other's mouths, and she washes his bloody hands with the same liquor which they are drinking. Thus they go revelling, with excessive merriment, to their place of abode; and, having piled up the heads of their enemies in the court-yard of their chieftain's house, they sing and dance round the pile; after which they kill some *gayals* and hogs with their spears, and, having boiled the flesh, make a feast on it, and drink the fermented liquor. The richer men of this race fasten the heads of their foes on a bamboo, and fix it on the graves of their parents; by which acts they acquire great reputation. He who brings back the head of a slaughtered enemy, receives presents from the wealthy, of cattle and spirituous liquor; and, if any captives are brought alive, it is the prerogative of those chieftains who were not in the campaign, to strike off the heads of the captives. Their weapons are made by particular tribes; for some of them are unable to fabricate instruments of war.

IN regard to their civil institutions, the whole management of their household affairs belongs to the women; while the men are employed in clearing



clearing forests, building huts, cultivating land, making war, or hunting game and wild beasts. Five days (they never reckon by months or years) after the birth of a male child, and three days after that of a female, they entertain their family and kinsmen with boiled rice and fermented liquor; and the parents of the child partake of the feast. They begin the ceremony with fixing a pole in the court-yard; and then killing a *gayál*, or hog, with a lance, they consecrate it to their deity; after which all the party eat the flesh and drink liquor; closing the day with a dance and with songs. If any one among them be so deformed, by nature or by accident, as to be unfit for the propagation of his species, he gives up all thought of keeping house, and begs for his subsistence, like a religious mendicant, from door to door, continually dancing and singing. When such a person goes to the house of a rich and liberal man, the owner of the house usually strings together a number of red and white stones, and fixes one end of the string on a long cane, so that the other end may hang down to the ground; then paying a kind of superstitious homage to the pebbles, he gives alms to the beggar; after which he kills a *gayál* and a hog, and some other quadrupeds, and invites his tribe to a feast. The giver of such an entertainment acquires extraordinary fame in the nation; and all unite in applauding him with every token of honour and reverence.

WHEN a *Chú* dies, all his kinsmen join in killing a hog and a *gayál*; and, having boiled the meat, pour some liquor into the mouth of the deceased, round whose body they twist a piece of cloth by way of shroud: all of them taste the same liquor as an offering to his soul; and this ceremony they repeat at intervals for several days. Then they lay the body on a stage, and, kindling a fire under it, pierce it with a spit and

dry it : when it is perfectly dried they cover it with two or three folds of cloth ; and inclosing it in a little case within a chest, bury it under ground. All the fruits and flowers that they gather within a year after the burial, they scatter on the grave of the deceased ; but some bury their dead in a different manner ; covering them first with a shroud, then with a mat of woven reeds, and hanging them on a high tree. Some, when the flesh is decayed, wash the bones, and keep them dry in a bowl, which they open on every sudden emergency ; and, fancying themselves at a consultation with the bones, pursue whatever measures they think proper ; alleging, that they act by the command of their departed parents and kinsmen. A widow is obliged to remain a whole year near the grave of her husband, where her family bring her food : if she die within the year, they mourn for her ; if she live, they carry her back to her house, where all her relations are entertained with the usual feast of the *Cûcis*.

IF the deceased leaves three sons, the eldest and the youngest share all his property, but the middle son takes nothing : if he hath no sons, his estate goes to his brothers ; and, if he has no brothers, it escheats to the chief of the tribe.

#### NOTE.

A PARTY of *Cûcis* visited the late CHARLES CROFTES, Esq. at *Jasfarabâd*, in the spring of 1776, and entertained him with a dance : they promised to return after their harvest, and seemed much pleased with their reception.



### XIII.

#### ON THE SECOND CLASSICAL BOOK OF THE CHINESE.

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BY THE PRESIDENT.

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THE vicinity of *China to our Indian* territories, from the capital of which there are not more than *fix hundred miles* to the province of YU'NA'N, must necessarily draw our attention to that most ancient and wonderful empire, even if we had no commercial intercourse with its more distant and maritime provinces; and the benefits that might be derived from a more intimate connexion with a nation long famed for their useful arts, and for the valuable productions of their country, are too apparent to require any proof or illustration. My own inclinations and the course of my studies lead me rather to consider at present their *laws, politics, and morals* (with which their general literature is closely blended) than their manufactures and trade; nor will I spare either pains or expence to procure translations of their most approved *law-tracts*, that I may return to *Europe* with distinct ideas, drawn from the fountain-head of the wisest *Asiatic* legislation. It will probably be a long time before accurate returns can be made to my inquiries concerning the *Chinese laws*; and, in the interval, the Society will not perhaps be displeased to know, that a translation of a most venerable and excellent work may be expected from *Canton*, through the kind assistance of an inflexible correspondent.

ACCORDING to a *Chinese* writer, named LI YANG PING, 'the ancient characters used in his country were the outlines of visible ob-

jects, earthly and celestial; but as things merely intellectual could not be expressed by those figures, the grammarians of *China* contrived to represent the various operations of the mind by metaphors drawn from the productions of nature: thus the idea of roughness and of rotundity, of motion and rest, were conveyed to the eye by signs representing a mountain, the sky, a river, and the earth; the figures of the sun, the moon, and the stars, differently combined, stood for smoothness and splendor, for any thing artfully wrought, or woven with delicate workmanship; extension, growth, increase, and many other qualities, were painted in characters taken from the clouds, from the firmament, and from the vegetable part of the creation; the different ways of moving, agility and slowness, idleness and diligence, were expressed by various insects, birds, fish, and quadrupeds. In this manner passions and sentiments were traced by the pencil, and ideas not subject to any sense were exhibited to the sight, until by degrees new combinations were invented, new expressions added; the characters deviated imperceptibly from their primitive shape, and the *Chinese* language became not only clear and forcible, but rich and elegant in the highest degree.'

IN this language, so ancient and so wonderfully composed, are a multitude of books, abounding in useful as well as agreeable knowledge; but the highest class consists of *Five* works; one of which at least every *Chinese* who aspires to literary honours must read again and again, until he possesses it perfectly.

THE *first* is purely *Historical*, containing annals of the empire from the two-thousand-three hundred-thirty-seventh year before CHRIST: it is entitled SHU' KING, and a version of it has been published in *France*; to which  
country

country we are indebted for the most authentic and most valuable specimens of *Chinese* history and literature, from the compositions which preceded those of HOMER to the poetical works of the present Emperor, who seems to be a man of the brightest genius and the most amiable affections. We may smile, if we please, at the levity of the *French*, as they laugh without scruple at our seriousness; but let us not so far undervalue our rivals in arts and in arms as to deny them their just commendation, or to relax our efforts in that noble struggle, by which alone we can preserve our own eminence.

THE Second Classical work of the *Chinese* contains *three hundred* Odes, or short Poems, in praise of ancient sovereigns and legislators, or descriptive of ancient manners, and recommending an imitation of them in the discharge of all public and domestic duties: they abound in wise maxims and excellent precepts; ‘their whole doctrine,’ according to *Cai-fu-tsu*, in the *Lu’nyu*, or *Moral Discourses*, ‘being reducible to ‘this grand rule, that we should not even entertain a thought of any ‘thing base or culpable;’ but the copies of the *SUI KING*, for that is the title of the book, are supposed to have been much disfigured since the time of that great philosopher, by spurious passages and exceptionable interpolations; and the style of the Poems is in some parts too metaphorical, while the brevity of other parts renders them obscure; though many think even this obscurity sublime and venerable, like that of ancient cloysters and temples, ‘*shedding*,’ as MILTON expresses it, ‘*o dim religious light*.’ There is another passage in the *Lu’nyu* which deserves to be set down at length: ‘Why, my sons, do you not study ‘the book of Odes? If we creep on the ground, if we lie uselets and ‘inglorious, those poems will raise us to true glory: in them we see,

‘ as in a mirror, what may best become us, and what will be unbecoming; by their influence we shall be made social, affable, benevolent; for, as music combines sounds in just melody, so the ancient poetry tempers and composes our passions: the Odes teach us our duty to our parents at home, and abroad to our prince; they instruct us also delightfully in the various productions of nature.’ ‘ Hast thou studied,’ said the philosopher to his son PEYU, ‘ the first of the three hundred Odes on the nuptials of Prince VENVA’M and the virtuous TAI JIN? He who studies them not, resembles a man with his face against a wall, unable to advance a step in virtue and wisdom.’ Most of those Odes are near *three thousand* years old, and some, if we give credit to the *Chinese* annals, considerably older; but others are somewhat more recent, having been composed under the later Emperors of the *third* family, called SHEU. The work is printed in *four* volumes; and, towards the end of the *first*, we find the Ode which COUPLER has accurately translated at the beginning of the TA’ HIO, or *Great Science*, where it is finely amplified by the philosopher. I produce the original from the SHI’ KING itself, and from the book in which it is cited, together with a double version, one verbal and another metrical: the only method of doing justice to the poetical compositions of the *Asiatics*. It is a panegyric on VUCU’N, Prince of *Guey*, in the province of *Honang*, who died, near a century old, in the *thirteenth* year of the Emperor PINGVANG, *seven hundred and fifty-six* years before the birth of CHRIST, or *one hundred and forty-eight*, according to Sir ISAAC NEWTON, after the taking of *Troy*, so that the *Chinese* poet might have been contemporary with HESIOD and HOMER, or at least must have written the Ode before the *Iliad* and *Odyssey* were carried into *Greece* by LYCURGUS.

THE verbal translation of the thirty-two original characters is this :

- ' Behold<sup>1</sup> yon reach<sup>2</sup> of *the river*<sup>4</sup> K<sup>3</sup>I ;
- ' Its<sup>5</sup> green<sup>6</sup> reeds how<sup>7</sup> luxuriant ! how<sup>8</sup> luxuriant !
- ' Thus<sup>9</sup> is our<sup>11</sup> Prince<sup>12</sup> adorned<sup>10</sup> with virtues ;
- ' As<sup>13</sup> a carver<sup>14</sup>, as a filer<sup>15</sup>, of ivory<sup>16</sup>,
- ' As<sup>17</sup> a cutter<sup>18</sup>, as a polisher<sup>19</sup>, of gems<sup>20</sup>.
- ' O how<sup>21</sup> elate and sagacious ! O how<sup>22</sup> dauntless and composed
- ' How<sup>23</sup> worthy of fame ! How<sup>24</sup> worthy of reverence !
- ' We<sup>25</sup> have a Prince<sup>27</sup> adorned<sup>28</sup> with virtues<sup>26</sup>,
- ' Whom to the end<sup>29</sup> of *time*<sup>30</sup> we can not forget<sup>31</sup> <sup>32</sup>.

#### THE PARAPHRASE.

Behold, where yon blue riv'let glides  
 Along the laughing dale ;  
 Light reeds bedeck its verdant sides,  
 And frolic in the gale .

So shines our Prince ! In bright array  
 The Virtues round him wait ;  
 And sweetly smil'd th'auspicious day  
 That rais'd him o'er our state.

As pliant hands in shapes refin'd  
 Rich iv'ry carve and smoothe,  
 His *laws* thus mould each ductile mind,  
 And ev'ry passion soothe.



As gems are taught by patient art  
 In sparkling ranks to beam,  
 With *manners* thus he forms the heart,  
 And spreads a gen'ral gleam.

What soft, yet awful, dignity!  
 What meek, yet manly, grace!  
 What sweetness dances in his eye,  
 And blossoms in his face!

So shines our Prince! A sky-born crowd  
 Of virtues round him blaze:  
 Ne'er shall Oblivion's murky cloud  
 Obscure his deathless praise.

THE prediction of the Poet has hitherto been accomplished; but he little imagined that his composition would be admired, and his prince celebrated in a language not then formed, and by the natives of regions so remote from his own.

IN the *tenth* leaf of the TA' HIO, a beautiful comparison is quoted from another Ode in the SHI' KING, which deserves to be exhibited in the same form with the preceding.

- ' The peach tree, how fair! how graceful!  
 ' Its leaves, how blooming! how pleasant!  
 ' Such is a bride when she enters her bridegroom's house,  
 ' And pays due attention to her whole family.'

The simile may thus be rendered :

Gay child of Spring, the garden's queen,  
 Yon peach-tree charms the roving sight :  
 Its fragrant leaves how richly green !  
 Its blossoms how divinely bright !  
 So softly smiles the blooming bride  
 By love and conscious Virtue led  
 O'er her new mansion to preside,  
 And placid joys around her spread.

The next leaf exhibits a comparison of a different nature, rather sublime than agreeable, and conveying rather censure than praise :

<sup>1</sup> O how horribly impends <sup>2</sup> yon <sup>3</sup> southern <sup>4</sup> mountain !  
<sup>5</sup> Its rocks in how vast, low <sup>7</sup> rude a heap !  
 Thus <sup>9</sup> loquacious <sup>10</sup> thou fittest, O <sup>11</sup> minister of <sup>12</sup> YN ;  
<sup>13</sup> All the <sup>14</sup> people look up to thee with dread.

Which may be thus paraphrased :

See, where yon crag's imperious height  
 The funny highland crowns,  
 And, hideous as the brow of night,  
 Above the torrent flows as !  
 So frowls the Chief, whose will is law,  
 Regardless of our state ;  
 While millions gaze with painful awe,  
 With fear allied to hate.

It was a very ancient practice in *China* to paint or engrave moral sentences and approved verses on vessels in constant use; as the words **RENEW THYSELF** **DAILY** were inscribed on the basin of the emperor **TANG**, and the poem of **LI XIAO G**, who is now on the throne, in praise of **Tea**, has been published on a set of porcelain cups, and, if the description just cited of a selfish and indolent statesman were, in the same manner, constantly presented to the eyes and attention of rulers, it might produce some benefit to their subjects and to themselves; especially if the comment of **TSEM TSU**, who may be called the **XENOPHON**, as **CUN FU' TSU'** was the **SOCRATES**, and **MEM TSU** the **PLATO**, of *China*, were added to illustrate and enforce it.

If the rest of the *three hundred Odes* be similar to the specimens adduced by these great moralists in their works, which the *French* have made public, I should be very solicitous to procure our nation the honour of bringing to light the *second* Classical book of the *Curse*. The *third*, called **YERING**, or the book of Changes, believed to have been written by **FO**, the **HERMES** of the East, and consisting of eight lines variously disposed, is hardly intelligible to the most learned *Mandaries*; and **CUN FU' TSU'** himself, who was prevented by death from accomplishing his design of elucidating it was dissatisfied with all the interpretations of the earliest commentators. As to the *fifth*, or **LIKI**, which that excellent man compiled from old monuments, it consists chiefly of the *Chinese* ritual, and of tracts on Moral Duties; but the *fourth* entitled **CHUNG CIEU**, or *Spring* and *Autumn*, by which the same incomparable writer meant the *flourishing* state of an Empire, under a virtuous monarch, and the *fall* of kingdoms, under bad governors; must be an interesting work in every nation. The powers, however, of

an individual are so limited, and the field of knowledge is so vast, that I dare not promise more, than to procure, if any exertions of mine will avail, a complete translation of the *Sin' King*, together with an authentic abridgement of the *Chinese Laws*, civil and criminal. A native of *Canton*, whom I knew some years ago in *England*, and who passed his first examinations with credit in his way to literary distinctions, but was afterwards allured from the pursuit of learning by a prospect of success in trade, has favoured me with the *Three Hundred Odes* in the original, together with *Lu's Yu*, a faithful version of which was published at *Paris* near a century ago; but he seems to think, that it would require three or four years to complete a translation of them; and Mr. Cox informs me, that none of the *Chinese*, to whom he has access, possess leisure and perseverance enough for such a task; yet he hopes, with the assistance of *WHANG ARONG*, to send me next season some of the poems translated into *English*. A little encouragement would induce this young *Chinese* to visit *India*, and some of his countrymen would perhaps, accompany him; but, though considerable advantage to the public, as well as to letters, might be reaped from the knowledge and ingenuity of such emigrants, yet we must wait for a time of greater national wealth and prosperity, before such a measure can be formally recommended by us to our patrons at the helm of government.



IX. With ي for th	<p>لَقُوا met,          لَقُوا the act of making          لَقُوا happy,          مَبْتَغُوا ascertaining,          مَبْتَغُوا roused,          نَبَيْتُ application,</p>	<p>لَقُوا the act of revolting,          مَبْتَغُوا revolting,          مَبْتَغُوا revolted,          نَبَيْتُ inflexion,          مَبْتَغُوا altering,</p>
X. With ي for the	<p>مَبْتَغُوا wondering,          مَبْتَغُوا appointed,</p>	<p>عَبِي exaltation,          مَبْتَغُوا completing,</p>
XI. With ي for th	<p>مَبْتَغُوا rebellion,          مَبْتَغُوا willing,          مَبْتَغُوا wished,</p>	<p>عَبِي exaltation,          مَبْتَغُوا completing,</p>
XII. With ا for th the 2d radi	<p>مَبْتَغُوا expofition,          مَبْتَغُوا interpreting,          مَبْتَغُوا translated,</p>	<p>عَبِي exaltation,          مَبْتَغُوا completing,</p>

يُدِّي

يُدِّي

يُدِّي

يُدِّي benefited,

يُدِّي having strong cattle, قوي

يُدِّي

يُدِّي vivification,

يُدِّي

يُدِّي vivifying,

## ADVERTISEMENT.

**E**XAMPLES of derivatives from Arabic Quadrilaterals rarely occur in the Persian language; and from the 9th, 11th, 12th, and 13th Conjugations of the Trilaterals there are none to be met with. I have therefore confined my observations to the nine Conjugations included in the Table. And although particular senses and uses are assigned to each of these by Grammarians, (which may be seen in Mr. Richardson's Gram. p. 66) it is at the same time to be observed, that they are nevertheless frequently used in other senses; many of them retaining the simple signification of the primitives: and that every root does not extend through every Conjugation; but that some are used in one form, many in several; none in all.

These observations are applicable to the present subject; and the derivatives of such Conjugations as are more frequently used in the Arabic seem also to be more frequently than any other introduced into the Persian.

Where no Example of any particular form is to be found in Golius and Me-nascki I have left a blank in the Table, which may be filled up whenever any can be met with.

With regard to the Examples which I have brought to illustrate the following Rules they are such as came first to hand; and the Example of each finite or Participle is intended as a representation of the Infinitive of the same Principles of every species and conjugation. To have attempted a more



of examples would have carried me far beyond the limits of my present undertaking.

## OF ARABIC INFINITIVES.

I. Their Masculine Singulars are used in the Persian as substantives; and in every respect serve the same purposes, and are subject to the same rules of construction, as Substantives originally Persian.

Ex. 1. governing a sub. fol.

اظهارِ بکائی demonstrations of unanimity.

2. agreeing with an ad. fol.

استعجالِ تمام great haste.

3. agreeing with a part. past. fol.

تحریرِ مسطور the said writing.

4. nominatives to verbs,

نظمِ بر آیینِ بود my view was this.

5. governed by verbs,

احضاضِ وافریادت he received great delight.

6. governed by a preposition,

بعد از تقدیمِ مراسم after performing the duties.

7. united by a conjunction,

اقبال و اجلال prosperity and splendor.

8. rendered definite by affixing ی

اتحادِ ی که میانِ بود the union that was between.

II. Their Masculine Plurals are used in the Persian as substantives; and in every respect serve the same purposes, and are subject to the same rules of construction as Substantives originally Persian.

Ex. 1. governing a sub. fol.

اختلافِ مردم the dispositions of men.

2. agreeing

2. agreeing with an ad. fol.      **افعال نیک** good actions  
 3. agreeing with a part. paf. fol.      **اطوارِ مسطور** the qualification described.

III. Their Feminine Singulars are used in the Persian as Substantives; and in every respect serve the same purposes, and are subject to the same rules of construction as Substantives originally Persian.

- Ex. 1. nominatives to verbs,      **اجاز است** there is permission.  
 2. governing a substantive following, **معاملتِ ملک** the business of the empire.  
 3. agreeing with an ad. fol.      **مقاتلهٔ خلیبه** a bloody battle.  
 4. agreeing with a part. paf. fol. **مکتوبهٔ مر توعد بدوستی** a letter written in friendship.

IV. Their Feminine Plurals are used in the Persian as substantives; and in every respect serve the same purposes, and are subject to the same rules of construction, as Substantives originally Persian

- Ex. 1. governing a sub. fol.      **توجهاتِ دوستان** the civilities of friends.  
 2. agreeing with an ad. fol.      **معاملاتِ کلی** public affairs.  
 3. agreeing with a part. paf. fol. **تکلیفاتِ مزبور** the said breathers.

V. The Infinitives of the first Conjugation of Transitive Verbs are regularly of the form exhibited in the Table. But those of Intransitive are reducible to no prop.

proper rule with an innumerable exceptions. Grammarians make of them in all thirty-six different forms, which may be seen in Mr. Richardson's Grammar, p. 62: but for these irregularities he justly observes that a dictionary is the only proper guide. These Infinitives, both Singulars and Plurals, are introduced freely into the Persian as Substantives.

Ex. governing another sub. fol. **وصولِ مکتوب** the arrival of the letter,  
&c. &c.

### OF ARABIC PARTICIPLES ACTIVE.

1. Their Masculine Singulars are used in the Persian as Participles, as Substantives, and as Adjectives.

Ex. 1. as participles with a verb fol. **منتظر ماند** he remained expecting.  
**طالع و لامع باد** be shining and blazing.

2. as sub. governing another sub. fol. **حاکم شهر** governor of the city.  
**موجبِ خوشنودی** causing gladness—the  
cause of gladness.

**مصنّف این کتاب** composing this book---  
the author of this book.  
**مطابقِ شرعِ شریف** following the noble law  
---follower of the noble law.

3. as an ad. qualifying a sub. **مردمِ قابل** an able man.

4. following another sub. signifying  
the same thing, **حضرت خالق** God the creator.

5. agreeing

5. agreeing with an ad. fol. عاملِ نیک a good agent.  
 6. agreeing with a part. paf. fol. حاکمِ مستقل absolute judge.  
 7. governed by a verb, قاتلرا کشت he put the murderer  
 to death.  
 8. nominatives to verbs, اگر عاشقِ صادق است if the lover be sincere.  
 9. with a preposn. fol.  
 an uncommon construction, بر مصادقت containing friendship.

II. Their Masculine perfect Plurals are used in the Persian as Substantives, in the form of the oblique case which terminates in *یین*. But they do not seem to be used in the form of the nominative which terminates in *ون*.

- Ex. 1. governed by a sub. going  
 before, علمِ اولین و آخرین the knowledge of the  
 moderns and ancients.  
 قومِ مسلمین the sect of the faithful.

III. Their Masculine imperfect Plurals are used in the Persian as Substantives.

- Ex. 1. governing a sub. fol. حکامِ حال و استقبال officer of the present  
 and future.  
 2. agreeing with an ad. fol. عبالِ جدید و قدیم the new and old agents.

IV. Their Feminine Singulars are used in the Persian as Participles, as Substantives, and as Adjectives.

- Ex. 1. as a part. act. with a verb fol. حامله است she is pregnant.  
 2. as a sub. governing another fol. مالکۀ ملک queen of the empire.

3. as an ad. qualifying a sub. going

before,

زین حامله a pregnant woman.

4. as a sub. qualified by an ad.

following,

مشفقہ مہربان kind friend.

5. as a sub. qualified by a part.

part. following,

صاحبہ موصوفہ accomplished lady.

V. Their Feminine perfect Plurals are used in the Persian as Substantives expressing things without life.

Ex. 1. governing a sub. fol.

واقعات زمان the incidents of time.

2. agreeing with an ad. fol.

وارداتِ ناکہا نی unforeseen events.

### Of ARABIC PARTICIPLES PASSIVE.

I. Their Masculine Singulars are used in the Persian as Participles Passive, as Substantives, and as Adjectives.

Ex. 1. as a part. pass. هبت صروف بران است the sum of my desire  
is bestowed on that.

ظلّ شفق مہدو دیاد be the shade of clemency extended.

2. as a sub. governing

another fol. it. مشہود ضمیر منیر میگرداید I make it the perception  
(i. e. the thing perceived) of your enlightened  
soul; i. e. I represent  
it, &c.

مرغوب

مرغوب طبایع the desire, (i. e. the thing  
desired) of the souls

3. as an ad. qualifying a sub. going

before,

بندۀ مظلوم the injured slave.

4. joined with another sub. by a

conjunction,

مقصود و مرام intention and design.

5. governed by verbs, محظوظان کردند اندک make the people glad.

6. nominatives to verbs, منصوب او شان بر این بود their intention was this.

II. Their Masculine perfect Plural does not seem to be used in the Persian, either in the form of the nominative or the oblique case.

III. Their Feminine Singulars are used in the Persian as Substantives, and as Adjectives.

Ex. 1. as a sub. governing another fol. it, معشوقه من my beloved, i. e. the be-  
loved of me.

2. as a sub. agreeing with a part.

pass. following,

معشوقه مذکوره the said beloved woman.

3. as an ad. agreeing with a sub.

going before,

والده محترمۀ respected mother.

IV. Their Feminine perfect Plurals are used in the Persian as Substantives, to express things without life.

Ex. 1. governing a sub. fol. مطالبات آن مهربان the demands of that  
friend.

2. agreeing with an ad. fol.

مقدمات شرعی law affairs.

V. The Active and Passive Participles of Transitive verbs form, with a following substantive having the Article *ال* prefixed to it, compounds corresponding to that of *خوبروى*, which are used in the Persian as Substantives, and as Adjectives.

Ex. 1. as a sub. a nominative

to the verb, *متعذر الفصل است* he evades a decision.

2. as an ad. qualifying a sub. *شخص واجب التعظيم* a person deserving respect.

*قلم منقطع اللسان* a pen, cut short in the point.

### Of ARABIC ADJECTIVES *resembling* PARTICIPLES.

1. The forms *حَسَنٌ صَعْبٌ سَرِيبٌ* represent three species of Arabic words which are derived from Intransitive verbs; and called by Arabic Grammarians, Adjectives resembling Participles. The Singulars of these forms are used in the Persian both as Adjectives and Substantives.

Ex. 1. as a sub. qualified by the

pronoun dem.

*آن عزیز* that respectable person.

2. with a verb.

*شرير است* he is wicked.

3. as an ad. qualifying a sub. *دوستِ قدیم* an old friend.

II. Their Plurals are used in the Persian as Substantives.

Ex. 1. governing a sub. fol.

*حکمای یونان* the learned men of  
Greece.

2. agreeing with an ad. fol. *شرفای پاک نهاد* noblemen of integrity.

III. These

V. These three forms of Adjectives resembling Participles, form, with a following Substantive having the Article *ال* prefixed to it, compounds corresponding to that of *خوب‌روى*, which are used in the Persian both as Substantives and Adjectives.

Ex. 1. as a sub. qualified by the

pro. demonstr.

*آن حسن‌الوجه* that beauty.

*آن قدیم‌الخدمت* that old servant.

2. as a sub. qualified by

an ad. fol.

*قدیم‌الخدمت مذکور* the said old servant.

3. as an ad. qualifying a sub.

going before,

*مردم قدیم‌الخدمت* a man of long service.

Of PARTICIPLES *expressing the sense of their PRIMITIVES in a stronger degree.*

I. The forms *نَصَبٌ نَصَارٌ نَصُورٌ نَصْرٌ مَنْصَارٌ* are Participles which express the sense of their primitives in a stronger degree; and are sometimes used in the Persian as Adjectives.

Ex. 1. agreeing with a sub. going before, *ادویه قَتَّالَه* a poisonous medicine.

2. agreeing with a verb fol.

*صبور است* he is full of patience.

*صَرِيب* Is the form of a Participle expressing the sense of the primitive in a less degree; but it does not seem to be used in the Persian.

### Of ARABIC SUBSTANTIVES.

I. The Arabic Noun of time and place are frequently employed in the Persian; and the following list exhibits the forms of such as are derived from the first Conjugations of the different species of Triliterals.

CONJU-



## CONJUGATION 1st.

NOUNS of TIME and PLACE from TRILITERALS.

	FROM	Roots.
I.	مَدَنَبُ the time and place of writing,	ك ت ب
II.	مَقَرُّ a place of rest, residence,	ق ر
III.	مَأْمِنُ a place of safety,	ا م ن
V.	مَبْدَأُ the place and time of beginning,	ب د ا
VI.	مَوْضِعُ place, opportunity,	و ض ع
VII.	مَقَامُ the place and time of standing,	ق و م
VIII.	مَدْعَا the place or object of desire,	د ه و
X.	مَبِيعُ the place and time of selling,	ب ع
XI.	مَرْمَا the place and time of throwing,	ر م ي
XII.	مَأْبُ the place of return, the center,	ا و ب
XV.	مَجِئُ the time of coming—arrival,	ج ي
XVII.	مَأْنَا the place, the way of approaching,	ا ت ي
XVIII.	مَرَأُ the place of looking, beholding,	ر ا ي
XIX.	مَوْلَا وَمَوْلِيُ the place of power—and thus Lord, Master, &c.	و ل ي
XXI.	مِهْوَا a place of division—the interval,	ه و ي
XXII.	مَحْيَا the time and place of living,	ح ي
XXIII.	مَأْوَا وَمَاوِيُ a place of habitation—refuge,	ا و ي

———To express the *place* more particularly, ة is sometimes added to the common form as مَقْبَرَةٌ a burning place.

II. The

II. The Noun of time and place from the derivative Conjugations is exactly the same with the Participle Passive ; and is also used in the Persian.

Ex. 1. a part. Passive from the 10th  
conjugation,

مستودع deposited—also a place  
of deposit.

III. The Persian language has terms proper to itself for expressing the Instrument of Action ; it does not however reject the use of the Arabic Instrumental Noun which is represented by the forms. مُنْصَرِّتٌ or مُنْصَرِّقٌ

Ex. 1. governing another  
sub. fol.

بهیزان عقل سنجید he weighed in scale of  
reason.

مفتاح مقصود the key of his intention.

IV. All Arabic proper names, and the names of things, are introduced into the Persian at pleasure.

Ex. مريم Mary, مکه Mecca, عین the eye, لحم flesh, جدّ an ancestor,  
&c. &c.

### OF ARABIC ADJECTIVES.

I. Besides the Arabic Participles which we have already observed are used as Adjectives, there is also a plentiful source of real Adjectives formed by affixing ي to Substantives of almost every denomination, which are freely introduced into the Persian.

Ex.

Ex. انساني humane, اراضي earthly, مصري Egyptian, &c. &c.

II. The Masculine Singulars of Arabic Superlatives are used in the Persian both as Substantives and Adjectives.

Ex. 1. as a sub. governing another fol. it, اسعد زمان the most fortunate of times.

2. as an ad. qualifying a sub.

going before,

در وقت احسن at a most lucky time.

III. The Masculine Plurals of Arabic Superlatives are used in the Persian both as Substantives and Adjectives.

Ex. 1. as a sub. governing another fol. it, اکابر وقت the great men of the age.

2. as an ad. qualifying a sub.

going before,

اشخاص اکابر most illustrious person-ages.

IV. The Feminine Singulars of Arabic Superlatives are used in the Persian as Adjectives.

Ex. 1. qualifying a sub. going before, دولت عظمی prosperity most great.

V. Arabic Ordinal Numbers are used in the Persian as Adjectives.

Ex. 1. qualifying a sub. going before, باب اول the first chapter.

## OF THE FORM OF ARABIC WORDS WHEN USED IN THE PERSIAN.

I. All Arabic Infinitives, Participles, Substantives, and Adjectives, are introduced into the Persian in the form of the nominative, which throws away from the last letter every species of Nunnation (ـة), or short vowel (ـى), which they may possess as Arabic words, and remain without motion; but, when their construction in the Persian requires them to assume the termination of another case, they receive it in the same manner as if they were originally Persian words; with the following exceptions:

1st. When an Arabic word terminating in **ي**, that must be pronounced as **l**\*, becomes the first Substantive in construction with another Substantive following it, **ي** is actually changed into **l**, to which short **ى** (ـى) is afterwards affixed, to shew the construction.

Ex. **تنبی** in construction becomes **تنبای** as **شاعت** as **تنبای شاعت** the petition of intercession, and so also **موی دعوی** **مہنی** &c.

2d. Feminine Arabic Substantives terminating in **ة**, when introduced into the Persian, change **ة**, sometimes into **ی**, and sometimes into **ت**

Ex. **محبۃ** friendship, being found written by the same author **محبہ** and **مہبت**

3d. Feminine Arabic Adjectives and Participles terminating in **ة**, when introduced into the Persian, always change **ة** into **ی**.

\* See Richardson's Arabic Gram. p. 100, Canon III

Ex. خالصه pure, is always written خالصه as محبت خالصه pure friendship.

4th. Arabic Participles Plural, terminating in بين, although introduced into the Persian as Nominatives, are originally the oblique case.

Ex. دانایان متقدمین چنین فرمودند the learned ancients thus said.

5th. When an Arabic Infinitive is used in the Persian language as an adverb, it is introduced in the form of the Arabic accusative without any change.

Ex. اتفاقا accidentally, &c. &c.

## OF ARABIC ADVERBS, PREPOSITIONS, AND CONJUNCTIONS.

I. Arabic Adverbs, Prepositions, and Conjunctions seem to be introduced into the Persian language at pleasure. Of these Mr. Richardson has made a very useful collection in his chapter of separate Particles, to which I beg leave to refer; observing at the same time, that a knowledge of such, as are most frequently employed, will easily be acquired from experience without any particular instructions.

## Of ARABIC COMPOUNDS.

I. The manner in which different Arabic parts of speech are employed to form a variety of compounded words made use of in the Persian is well expressed by Sir William Jones, in his Persian Grammar; and, with respect to phrases purely Arabic

Arabic, and whole sentences, which are often met with in Persian authors, they require a perfect knowledge of the Arabic language, and do not belong to this place.

## OF THE CONSTRUCTION OF ARABIC INFINITIVES, PARTICIPLES, SUBSTANTIVES, AND ADJECTIVES.

I. In the Persian language, when Arabic Adjectives or Participles are made use of to qualify Arabic or Persian Substantives Singular, they agree with them in Gender and Number.

Ex. 1. an Arabic sub. masc. qualified

by an Arabic part. pass. masc. عاشق مذکور the said lover.

2. an Arabic sub. fem. qualified by

an Arabic part. pass. fem. والده مکرمه respected mother

3. a Persian sub. masc. qualified by

an Arabic adj. masc. دوست قدیم an old friend.

4. a Persian sub. fem. qualified by

an Arabic adj. fem. همشیره عزیزه dear sister.

II. When Arabic Adjectives and Participles are made use of to qualify Arabic Substantives Masculine and Plural; they remain in the Masculine Singular.

Ex. 1. an Arab. sub. masc. plur. with

an Arab. part. masc. sing. حاکم مذکور the said officers.

2. a Pers. sub. masc. plur. with an

Arab. part. masc. sing. برادران مذکور the said brethren.

III. When Arabic Adjectives and Participles are made use of to qualify Arabic or Persian Substantives Feminine and Plural, they are put in the Feminine Singular; and often, though not so properly, in the Masculine Singular.

Ex. 1. An Arabic sub. fem.

plur. with Arabic part.

sing. both fem. masc. تكلیفات مذکورہ مذکور the said burthens.

2. A Persian subst. femin.

plur. with Arabic partic.

sing. both fem. and masc. زبان موصوفہ موصوف accomplished women.

IV. An Arabic Substantive, in the Persian, is often rendered definite by a following Arabic Adjective or Participle having the article ال prefixed.

Ex. a sub. with a part. pass.

نبي البختار the prophet elect.

For an account of the Genders of Arabic Words, and of their perfect and imperfect Plurals, I must again refer to Mr. Richardson's Arabic Grammar; and to that of ERPENIUS, where the latter subject is treated at full greater length.

## OF THE INTRODUCTION OF THE ARABIC INTO THE LANGUAGE OF HINDOSTAN.

I. All the different species of Infinitives, Participles, Substantives and Adjectives which we have enumerated; and all compounds formed by Arabic and Persian

*fian* words, are introduced into the language of *Hindoſtan*, in the ſame form, for the ſame purpoſes, and with the ſame freedom as in the *Perſian*: ſubmitting themſelves to the different rules of regimen and concord, that are peculiar to *that* language; in the ſame manner as if they were words originally belonging to it. *Arabic* Adverbs, Prepoſitions, and Conjunctions are alſo uſed in the language of *Hindoſtan*; but I think leſs frequently than in the *Perſian*.





## XV.

## ON THE ASTRONOMICAL COMPUTATIONS OF THE HINDUS.

BY SAMUEL DAVIS, Esq.

*Bhágalpur, 15th Feb. 1789.*

**I**T is, I believe, generally admitted, that inquiries into the Astronomy of the *Hindus* may lead to much curious information, besides what relates merely to the science itself; and that attempts to ascertain the Chronology of this ancient nation will, as they have hitherto done, prove unsatisfactory, unless assistance be derived from such researches.

The following communication is not expected to contribute towards so desirable a purpose; but, with all its imperfections, it may have the useful effect of awakening the attention of others in this country, who are better qualified for such investigations, and of inciting them to pursue the same object more successfully, by showing that numerous treatises in *Sanscrit* on Astronomy are procurable, and the *Bráhmens* are extremely willing to explain them. As an encouragement to those, who may be inclined to amuse themselves in this way, I can farther venture to declare, from the experience I have had, that *Sanscrit* books in this science are more easily translated than almost any others, when once the technical terms are understood, the subject of them admitting neither of metaphysical reasoning, nor of metaphor, but being delivered in plain terms, and generally illustrated with examples in practice, the meaning may be well enough made out, by the help of a *Pandit*, through the medium of the *Persian* or the *Hindí* language.

Moreover

Moreover it does not appear, that skill in the abstruse parts of modern mathematics is indispensably necessary, but that, with as much knowledge of geometry and the circles of the sphere as it may be supposed, most of the members of this society possess, a considerable progress, might be made in revealing many interesting particulars, which at present lie hid to *Europeans* in the *Jyôtiṣh*, or Astronomical, *Śāstra*.

The prediction of eclipses and other phenomena, published in the *Hindu Patra* or Almanack, excited my curiosity long ago, to know by what means it was effected; but it was not until lately that I had any means of gratification: I had before this been inclined to think with many others, that the *Brâhmins* possess no more knowledge in astronomy than they have derived from their ancestors in tables ready calculated to their hands, and that few traces of the principles of the science could be found among them; but consulting some *Sanscrit* books, I was induced to alter my opinion. To satisfy myself on this subject, I began with calculating, by a modern *Hindu* formula, an eclipse which will happen in next *November*; the particulars of which process, although in some measure interesting, were not sufficient for my purpose, as it yet remained to be learnt, on what grounds some tables used in it were constructed; and for this information I was referred to the *Sârya Siddhânta*, an original treatise, and reputed a divine revelation. For a copy of the *Sârya Siddhânta* I am indebted to Sir ROBERT CHAMBERS, who procured it among other books at *Banars*; but the obscurity of many technical terms made it sometimes difficult to be understood even by the *Pandit* I employed, who was by no means deeply versed in the science he professed. By his diligence and through the obliging assistance of Mr. DUNN at *Banars*, who procured for me the *Tîkā* or commentary, this

difficulty was at length surmounted; and a computation of the above-mentioned eclipse, not merely on the principles, but strictly by the rules of the *Sûrya Siddhânta*, is what I propose now to present you with, after such preliminary observations as may be necessary to make it intelligible.

I SUPPOSE it sufficiently well known, that the *Hindu* division of the ecliptic into signs, degrees, &c. is the same as ours; that their astronomical year is sydereal, or containing that space of time in which the sun, departing from a star, returns to the same; that it commences on the instant of his entering the sign *Aries*, or rather the *Hindu* constellation *Mêsha* \*; that each astronomical month contains as many even days and fractional parts as he stays in each sign; and that the civil differs from the astronomical account of time only in rejecting those fractions, and beginning the year and month at sun-rise, instead of the intermediate instant of the artificial day or night. Hence arises the unequal portion of time assigned to each month, dependent on the situation of the sun's apsis, and the distance of the vernal equinoctial colure from the beginning of *Mêsha* in the *Hindu* sphere; and by these means they avoid those errors which *Europeans*, from a different method of adjusting their calendar by intercalary days, have been subject to. An explanation of these matters would lead me beyond my present intention, which is to give a general account only of the method by which the *Hindus* compute eclipses, and thereby to show that a late *French* author was too hasty in asserting generally that they determine them "by set forms, couched in enig-

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\* Or, to be more particular, on his entering the *Nachâtas*, or lunar mansion (*Aśvini*). There were formerly only twenty-seven *Nachâtas*: a 28th (*Abhijit*) has been since added, taken out of the 21st and 22d, named *Uttarâshlâdâ* and *Śravanâ*. These three in their order comprehend 10°, 5°, and 11° 40' of the zodiac: the rest comprehend 13° 20' each.

matical verses \*," &c. So far are they from deserving the reproach of ignorance, which Monf. SONNERAT has implied, that on inquiry, I believe, the *Hindu* science of astronomy will be found as well known now as it ever was among them, although, perhaps, not so generally, by reason of the little encouragement men of science at present meet with, compared with what they formerly did under their native princes.

It has been common with astronomers to fix on some epoch, from which, as from a radix, to compute the planetary motions; and the ancient *Hindus* chose that point of time counted back, when, according to their motions as they had determined them, they must have been in conjunction in the beginning of *Mésha*, or *Aries*, and coeval with which circumstance they supposed the creation. This, as it concerned the planets only, would have produced a moderate term of years, compared with the enormous antiquity that will be hereafter stated; but, having discovered a slow motion of the nodes and apfides also, and taken it into the computation, they found it would require a length of time corresponding with 1955884890 years now expired, when they were so situated, and 2364115110 years more before they would return to the same situation again, forming together the grand anomalistic period denominated a *Calpa*, and fancifully assigned as the day of BRAHMA'. The *Calpa* they divided into *Manwanteras*, and greater and lesser *Yugas*. The use of the *Manwantera* is not stated in the *Sûrya Siddhânta*; but that of the *Muhâ*, or greater *Yug*, is sufficiently evident, as being an anomalistic period of the sun and moon, at the end of which the latter, with her apogee and ascending node, is found together with the sun in the first of *Aries*; the planets also deviating from

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\* See the translation of Monf. SONNERAT's Voyage.

that point only as much as is their latitude and the difference between their mean and true anomaly.

THESE cycles being so constructed as to contain a certain number of mean solar days, and the *Hindu* system assuming that at the creation, when the planets began their motions, a right line, drawn from the equinoctial point *Lancā* through the centre of the earth, would, if continued, have passed through the centres of the sun and planets to the first star in *Aries*; their mean longitude for any proposed time afterwards may be computed by proportion. As the revolutions a planet makes in any cycle are to the number of days composing it, so are the days given to its motion in that time; and, the even revolutions being rejected, the fraction, if any, shows its mean longitude at midnight under their first meridian of *Lancā*: for places east or west of that meridian a proportional allowance is made for the difference of longitude on the earth's surface, called in *Sanskrit* the *Djñtara*. The positions of the apses and nodes are computed in the same manner, and the equation of the mean to the true place, determined on principles which will be hereafter mentioned.

The division of the *Mahā Yug* into the *Satya*, *Tretā*, *Dwāpar*, and *Cālī* ages, does not appear from the *Sūrya Siddhānta* to answer any practical astronomical purpose, but to have been formed on ideas similar to the *golden*, *silver*, *brazen*, and *iron* ages of the *Greeks*. Their origin has however been ascribed to the precession of the equinoxes by those who will of course refer the *Manwantera* and *Cālpa* to the same foundation: either way the latter will be found anomalistic, as has been described, if I rightly understand the following passage in the first section of the *Sūrya Siddhānta*, the translation of which is, I believe, here correctly given.

—— “ TIME, of the denomination *Murta* \*, is estimated by respirations; six respirations make a *Vicalà*, sixty *Vicalàs* a *Danda*, sixty *Dandas* a *Nacshatra* day, and thirty *Nacshatra* days a *Nacshatra* month. The *Sàvan* month is that contained between thirty successive risings of *Sàru*, and varies in its length according to the *Lagna Bhujà*. Thirty *Ti'this* compose the *Chàndra* month. The *Saura* month is that in which the sun describes one sign of the zodiac, and his passage through the twelve signs is one year, and one of those years is a *Déva* day, or day of the Gods. When it is day at *Afura* †, it is night with the Gods; and when it is day with the Gods, it is night at *Afura*. Sixty of the *Déva* days, multiplied by six, give the *Déva* year; and twelve hundred of the *Déva* years form the aggregate of the four *Yugas*. To determine the *Saura* years contained in this aggregate, write down the following numbers, 4, 3, 2, which multiply by 10,000; the product 4320000 is the aggregate, or *Mahà Yuga*, including the *Sandhi* and *Sandhyanya* ‡. This is divided into four *Yugas*, by reason of the different proportions of *Virtue* prevailing on earth, in the following manner. Divide the aggregate 4320000 by 10, and multiply the quotient by four for the *Satya Yuga*, by three for the *Trètà*, by two for the *Dwápar*, and

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\* This is mean syderal time. A *Nacshatra*, or syderal day, is the time in which the earth makes a turn upon its axis, or, according to the *Hindus*, in which the stars make one complete revolution. This is shorter than the *Sàvan* or solar day, which varies in its length according to the *Lagna Bhujà* or right ascension, and also from the sun's unequal motion in the ecliptic; for both which circumstances the *Hindus* have their *equation of time*, as will appear in the calculation of the eclipse.

† *Afura*, the south pole, the habitation of the *Afura Loka*, or Demons, with whom the *Devas*, who reside at *Sumérú*, the north pole, wage eternal war.

‡ *Sandhi* and *Sandhyanya*, the morning and evening twilight. “ The proper words, I believe, are *Sandhyà* and *Sandhyānā*.

“ by

" by one for the *Calī Yug*. Divide either of the *Yugs* by six for its  
 " *Sandhi* and *Sandhyanya*. Seventy-one *Yugs* make a *Manwantera*; and  
 " at the close of each *Manwantera* there is a *Sandhi* equal to the *Satya*  
 " *Yug*, during which there is an universal deluge. Fourteen *Manwanteras*,  
 " including the *Sandhi*, compose a *Calpa*, and at the commencement of  
 " each *Calpa* there is a *Sandhi* equal to the *Satya Yug*, or 1,728,000 *Saura*  
 " years. A *Calpa* is therefore equal to 1,000 *Mahā Yugs*. One *Calpa* is  
 " a day with BRAHMA', and his night is of the same length; and the pe-  
 " riod of his life is 100 of his years. One half of the term of BRAHMA'S  
 " life, or fifty years, is expired, and of the remainder the first *Calpa* is  
 " begun; and six *Manwanteras*, including the *Sandhi*, are expired. The  
 " seventh *Manwantera*, into which we are now advanced, is named *Varvafwa-*  
 " *ta*: of this *Manwantera* twenty-seven *Mahā Yugs* are elapsed, and we  
 " are now in the *Satya Yug* of the twenty-eighth, which *Satya Yug* consists  
 " of 1,728,000 *Saura* years. The whole amount of years expired from  
 " the beginning of the *Calpa*\* to the present time, may hence be com-

* Construction of the <i>Calpa</i> .			Years	Computation of the period elapsed of the <i>Calpa</i> at the end of the last <i>Satya</i> age, when the <i>Sūrya Siddhānta</i> is supposed to have been written.
<i>Calī</i> ,	-	$\frac{4320000}{10}$	= 432000	<i>Sandhi</i> at the beginning of the <i>Calpa</i> , -- [Years. 1728000 6 <i>Manwanteras</i> , or 308448000 $\times$ 6 = 1850688000 27 <i>Maha Yugs</i> of the 7th <i>Manwantera</i> , or 4320000 $\times$ 27 = 116640000 <i>Satya</i> Age of the 28th <i>Maha Yug</i> , = 1728000 1970784000
<i>Dwapar</i> ,	-	$\frac{4320000}{10}$	$\times$ 2 = 864000	
<i>Treta</i>	-	$\frac{4320000}{10}$	$\times$ 3 = 1296000	
<i>Satya</i>	-	$\frac{4320000}{10}$	$\times$ 4 = 1728000	
Aggregate, or <i>Maha Yug</i> ,	-	-	4320000 71	
<i>Manwantera</i> ,	-	-	306720000	
With a <i>Sandhi</i> , equal to the <i>Satya Yug</i> ,	-	-	1728000	
			308448000 14	
<i>Calpa</i> ,	-	-	4318272000	
With a <i>Sandhi</i> equal to the <i>Satya Yug</i>	-	-	1728000	



“puted; but from the number of years so found must be made a deduction of one hundred times four hundred and seventy-four divine years, or of that product multiplied by three hundred and sixty for human years, that being the term of BRAHMA’s employment in the creation; after which the planetary motions commenced.

“SIXTY *Vicalas* make one *Calá*, sixty *Calás* one *Bhága*, thirty *Bhágas* one *Ráfi*, and there are twelve *Ráfis* in the *Bhagana* \*.

“† In one *Yug*, *Sárya*, *Budha*, and *Sucra* perform 432,0000 *Madhyama* revolutions through the zodiac. *Mangala*, *Vrihaspati*, and *Sani* make the same number of *Sighra* revolutions through it; *Chandra* makes 57,753,336 ‡ *Madhyama* revolutions; *Mangala* 2,296,832 *Madhyama* revolutions; *Budha*’s *Sighras* are 17,937,060; *Vrihaspati*’s *Madhyamas* 364,220; *Sucra*’s *Sighras* 7,022,376; *Sani*’s *Madhyamas* are 146,568. The *Chandróchcha* revolutions are 488,203; the retrograde revolutions of the *Chandrápáda* are 232,238.

“The time contained between sun-rise and sun-rise is the *Bhúmi Sávan* day: the number of those days contained in a *Yug* is 1,577,917,828 §. The

\* The division of the *Bhagana*, or zodiac, into signs, degrees, &c.

† *Surya* the Sun; *Budha*, Mercury; *Sucra*, Venus; *Mangala*, Mars; *Vrihaspati*, Jupiter; *Sani*, Saturn; *Chandra*, the Moon; the *Chandra Uchcha*, or *Chandróchcha*, the Moon’s apogee; *Chandra Páda*, the Moon’s ascending node. The *Madhyama* revolutions of Mars, Jupiter, and Saturn, and the *Sighra* revolutions of Venus and Mercury, answer to their revolutions about the sun.

‡ 57753336—4320000=53433336 lunar months, or lunations in a *Yug*; and  $\frac{1577917828}{53433336} = 29 \frac{31}{32}$  D. D.  
D. H. M. S. “ “ 53433336

P. 50, 6 &c. in each mean lunation, or in English time 29.12.44.2.47.36. 53433336—51840000 = 1593336 *Adhis* or intercalary lunar months in 4320000 solar syderal years.

§  $\frac{1577917828}{4320000} = 365.15.31.31.24$ . diurnal revolutions of the Sun, the length of the *Hindu*

“ number of *Nacshatra* days 1582237828 †; of *Chándra* days 1603000080;  
 “ of *Āilhi* months 1593336; of *Cshaya* *Ti'his* 25082252; of *Saura*  
 “ months 51840000. From either of the planets *Nacshatra* days deduct  
 “ the number of its revolutions, the remainder will be the number of its  
 “ *Sávan* days contained in a *Yug*. The difference between the number  
 “ of the revolutions of *Súrya* and *Chandra* gives the number of *Chándra*  
 “ months; and the difference between the *Saura* months and *Chándra* months

1582237828

†  $\frac{1582237828}{4320000} = 366.15.31.31.24.$  diurnal revolutions of the stars in one year.

1577917828

57753336 27. 19. 18. 1. 37. &c. The Moon's periodical month. The 1603000080

*Chándra*, or lunar days, called also *Ti'his*, are each one-thirtieth part of the moon's synodical month or relative period, and vary in length according to the inequality of her motion from the sun. The *Cshaya* *Ti'his* and *Āilhi*, or intercalary lunar months, are sufficiently evident.

The sun and planets preface alternately over the days of the week, which are named accordingly. The first day after the creation was *Ravivár*, or *Sunday*: it began at midnight, under the meridian of *Lancà*; and the *Ravivár* of the *Hindus* corresponds with our Sunday. The sun and planets in the same manner govern the years: hence they may be said to have *weeks* of years. DANIEL's prophecy is supposed to mean *weeks* of years.

The *Hindu* cycle of 60, supposed by some to be the Chaldean *Sofus*, is referred to the planet Jupiter: “one of these years is equal to the time in which by his mean motion, he (*Varahamihira*) advances one degree in his orbit” (Commentary on the *Súrya Siddhánta*.) This cycle is, I believe, wholly applied to astrology. Neither this cycle of 60 nor the *Pitris* day are mentioned in this part of the *Súrya Siddhánta*, where they might be expected to occur: perhaps on inquiry there may be found some reason for supposing them both of a later invention. “The *Pitris* inhabit behind *Chandá*, and their mid-day happens when *Chandá* is in conjunction with *Súrya*, and their midnight when *Chandá* is in opposition to *Súrya*; their morning, or sunrise, is at the end of half the *Crishna* *Pachha*, and their sunset at the end of half the *Sukla* *Pachha*: this is declared in the *Sátvika Samhitá*. Their names are *Agni*, *Savári*, &c. their day and night are therefore together equal to one *Chandá* month.” (Commentary.) Hence it appears, the *Hindus* have observed that the moon revolves once on her axis in a lunar month, and consequently has the same side always opposed to the earth. They have also noticed the difference of her apparent magnitude in the horizon and on the meridian, and endeavour to explain the cause of a phenomenon which *Europeans*, as well as themselves, are at a loss to account for.

“ gives

“ gives the number of *Adhi* months. Deduct the *Sávan* days from the  
 “ *Chándra* days, the remainder will be the number of *Ti'thi C'hayas*. The  
 “ number of *Adhi* months, *Ti'thi C'hayas*, *Nacshatra*, *Chándra*, and *Sávan*  
 “ days, multiplied severally by 1000, gives the number of each contained  
 “ in a *Calpa*.

“ THE number of *Mandóhcha* revolutions, which revolutions are direct,  
 “ or according to the order of the signs contained in a *Calpa*, is of  
 “ *Súrya* 387; of *Mangala* 204; of *Budha* 368; of *Vrihaspati* 900; of  
 “ *Sucra* 535; of *Sani* 39.

“ THE number of revolutions of the *Pátas*, which revolutions are re-  
 “ trograde, or contrary to the order of the signs contained in a *Calpa*,  
 “ is of *Mangala* 214; of *Budha* 488; of *Vrihaspati* 174; of *Sucra* 903;  
 “ of *Sani* 662. The *Páta* and *Uchcha* of *Chandra* are already men-  
 “ tioned.”

IT must be observed, that, although the planetary motions as above determined might have served for computations in the time of MEYER, the author of the *Súrya Siddhánta*, yet for many years past they have not been found to agree with the observed places in the heavens in every instance, and that corrections have accordingly been introduced by increasing or reducing those numbers. Thus the motions of the moon's apogee and node are now increased in computations of their places by the addition of four revolutions each in a *Yug*, to their respective numbers above given. The nature of these corrections, denominated in *Sanscrit* *Bija*, is explained in a passage of the *Ticā*, or Commentary on the *Súrya Siddhánta*, wherein is maintained the priority of that *Sástra* in point of time

to all others. The translation of that passage, together with the text it illustrates, is as follows :

(*Sūrya Siddhānta*.) “ ARCA (the Sun) addressing MEYA, who attended  
 “ with reverence, said, Let your attention, abstracted from human con-  
 “ cerns, be wholly applied to what I shall relate. SŪRYA in every  
 “ former *Yug* revealed to the *Munis* the invariable science of astronomy.  
 “ The planetary motions may alter ; but the principles of that science are  
 “ always the same.”

(*The Commentary*.) “ Hence it appears that the *Sūrya Siddhānta* was  
 “ prior to the *Brahma Siddhānta* and every other *Sāstra*, because this  
 “ *Sāstra* must be the same that was revealed in every former *Yug*, al-  
 “ though the motions of the planets might have been different. This  
 “ variation in the planetary motions is mentioned in the *Viṣṇu Dharmōt-*  
 “ *ter*, which directs that the planets be observed with an instrument, where-  
 “ by their agreement or disagreement may be determined in regard to their  
 “ computed places ; and in case of the latter, an allowance of *Bija* accord-  
 “ ingly made. VASISHTHA in his *Siddhānta* also recommends this  
 “ occasional correction of *Bija*, saying to the *Muni* MA'NDĀVYA, “ I have  
 “ shown you how to determine some matters in astronomy ; but the  
 “ mean motion of *Sūrya* and the other planets will be found to differ  
 “ in each *Yug*.” Accordingly A'RYABHATTA, BRAHMACUPTA, and  
 “ others, having observed the heavens, formed rules on the principles of  
 “ former *Sāstras*, but which differed from each other in proportion to  
 “ the disagreement, which they severally observed, of the planets with  
 “ respect to their computed places.

“ WHY the *Munis*, who certainly knew, did not give the particulars of those deviations, may seem unaccountable, when the men A’RYABHATTA, BRAHMAGUPTA, and others, have determined them: the reason was, that those deviations are not in themselves uniform; and to state their variations would have been endless. It was therefore thought better, that examinations at different times should be made, and due corrections of the *Bija* introduced. A *Ganita Śāstra*, whose rules are demonstrable, is true; and when conjunctions, oppositions, and other planetary phenomena, calculated by such *Śāstras*, are found not to agree with observation, a proportionable *Bija* may be introduced without any derogation from their credit. It was therefore necessary that this *Śāstra* (the *Sūrya Siddhānta*) should be revealed in each *Yug*, and that other *Śāstras* should be composed by the *Munis*.

“ THE original *Śāstra* then appears to be the *Sūrya Siddhānta*; the second, the *Brahma Siddhānta*; the third, the *Paulastya Siddhānta*; the fourth, the *Sōma Siddhānta*.”

IN the following table are given the periodical revolutions of the planets, their nodes, and apsidæ, according to the *Sūrya Siddhānta*. The corrections of *Bija* at present used, are contained in one column\*, and the inclination of their orbits to the ecliptic in another. The obliquity of the ecliptic is inserted according to the same *Śāstra*. Its diminution

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\* This I must however at present omit, not having as yet discovered the corrections of this kind that will bring even the Sun’s place, computed by the *Sūrya Siddhānta*, exactly to an agreement with the astronomical books in present use. Of these books, the principal are the *Grahakāṇḍa*, composed about 268 years ago, the tables of *Macaranda* used at Benares and Tirhut, and the *Siddhānta Rahasya* used at Nálāya; the last written in 1513 *Sāca*, or 198 years ago.

does not appear to have been noticed in any subsequent treatise: in the tables of *Macaranda*, and also in the *Grahalāghava*, the latter written only 268 years ago, it is expressly stated at twenty-four degrees.

THE motion of the equinoxes, termed in *Sanſcrit* the *crānti*, and ſpoken of in the *Ticā*, or commentary, on the *Sūrya Siddhānta* as the Sun's *Pāta* or node, is noticed in the foregoing paſſage of that book; and, as the *Hindu* aſtronomers ſeem to entertain an idea of the ſubject different from that of its revolution through the *Platonic* year, I ſhall farther on give a tranſlation of what is mentioned, both in the original and commentary, concerning it.

THE next requiſite for the computation of the eclipse is the portion of the *Calpa* expired to the preſent time, which is determined in the following manner:

THE *Sūrya Siddhānta* is ſuppoſed to have been received through divine revelation, towards the cloſe of the *Satya* age, at the end of which 50 of the years of *Brahmā* were expired, and of the next *Calpa* or day, 6 *Manwanterās*, 27 greater *Yugs*, and the *Satya* age of the 28th *Yug*, together with the *Sandhyā* or twilight at the beginning of the *Calpa*; the aggregate of which ſeveral periods is 1970784000 years elapſed of the *Calpa* to the beginning of the laſt *Trētā* age; to which add the *Trētā* and *Dwāpar* ages, together with the years elapſed of the preſent *Cālī* age, for the whole amount of ſydereal years from the beginning of the *Calpa* to the preſent *Bengal* year. But in the foregoing quotation it is obſerved, from that amount of years muſt be made a deduction of 47400 divine, or 17064000 human or ſydereal years, the term of BRAHMA'S

THE TABLE. See page 236.

Syderal Period.		Period of the Apfides.		Period of the Nodes.		Mean motion per day " " per danda " "		Inclination of the Orbit.	Cachā or circumference of the Orbit.
Days.	D. P. V.	Days.	D.	Days.	D.	" "	" "		
27 10 18	1 & c.	3232 50	—	6794 23	—	790 35	—	4 50	324000
87 53 10	—	4287 520184	46 —	323742158	11	186 24	—	2 —	1043208
281 39 58	—	2949379117	45 & c.	1747117506	45	37	—	2 —	26646637
365 15 31	31 24	4077307049	5 —	Precession of the equinoxes 54' per year.		59 8	—	Obliquity of the Ecliptic 24°.	4531500
686 59 50	58	7735087392	9 & c.			31 26	—		8146909
4392 19 14	20 & c.	1753242031	6 & c.	7373447791	23 & c.	5 —	—	1 50	5' 375764
10765 46	2 18	42767123794	52 & c.	9068493264	22 & c.	2 —	—	1 —	127669255
				2983561673	42 & c.	2 —	—	2 —	

longitude of the sun's apogee in the *Hindu* sphere is 2, 17, 17, 15; to which add the *Ayanāntā* s. o. , the sun 3, 6, 38, 42 is its place according to *European* expression. In this the *Hindu* account but 1° 22' from the observations of *European* astronomers, who determine the place of the earth's in the present age to be in 9, 8, 1. There is a much greater disagreement with respect to the apelia of the other planets.

position that the obliquity of the ecliptic was accurately observed by the ancient *Hindus*, as 24°, and increase has been from that time half a second a year, the date of the *Sūrya Siddhānta* will be about 3. It is remarkable that the *Hindus* do not appear to have noticed its decrease.

*acphās* are explained farther on.

employment in the work of creation ; for, as the universe was not completed, the planetary motions did not commence until that portion of the *Calpa* was elapsed.

THIS deduction appears to have been intended as a correction ; which, without altering the date of the *Calpa*, as settled, probably, by yet more ancient astronomers, might (joined perhaps with other regulations) bring the computed places of the planets to an agreement with their observed places, when the *Sūrya Siddhānta* was written ; and, as the arguments of its commentator in support of the propriety of it, without prejudice to other authors, contain some curious particulars, I hope I may be excused for departing from my immediate object to insert a translation of them.

“ IN the *Sūrya Siddhānta*, *Sōma Siddhānta*, *Prajāpēti*, *Vāṣṣṭi*, and  
 “ other *Sāstras*, this deduction is required to be made from the *Calpa*,  
 “ because at the end of that term the planetary motions commenced. The  
 “ son of JISHNU, who understood four *Vēdas*, and BHĀSCARA'CHĀRYA,  
 “ considered these motions as commencing with the *Calpa* : it may seem  
 “ strange that there should be such a disagreement. Some men say, as it  
 “ is written that the *Calpa* is the day of BRAHMA', and as a day is de-  
 “ pendent on the rising and setting of the sun, the motion of the sun and  
 “ planets must have begun with the *Calpa* ; and therefore BRAHMAGUPTA  
 “ should be followed ; but I think otherwise. The *Calpa*, or BRAHMA's  
 “ day, is not to be understood as analogous to the solar day, otherwise  
 “ than as containing a determined portion of time ; neither is it at all de-  
 “ pendent on the commencement of the *Calpa* ; but, being composed of  
 “ the same periods as the latter, it will not end until the term of years here  
 “ deduced.



“ deducted shall be expired of the next *Calpa*. The motions of the  
 “ *Grahas* must therefore be computed from the point of time here stated  
 “ as the beginning of BRAHMA’S day, and not, as BRAHMAGUPTA and  
 “ others direct, from the beginning of the *Calpa*, which will not be found  
 “ to answer.

“ OTHER men say, that rules derived from the *Ganita Sastra* and agree-  
 “ ing with observation, are right; that any period deduced from such a  
 “ mode of computation, and the planets determined to have been then  
 “ in the first of *Mésa*, may be assumed; that it will therefore answer  
 “ either way, to consider these motions as beginning with the *Calpa*, or  
 “ after the above-mentioned period of it was expired. This however is  
 “ not true; for in the instance of *Mangala* there will be found a great  
 “ difference, as is here shown. The revolutions of *Mangala* in a *Calpa*,  
 “ according to BRAHMAGUPTA, are 2296828522; and, by the rule of  
 “ proportion, the revolutions of *Mangala* in 17064000 years are 9072472  
 “ <sup>Sig.</sup> 7 28 0 16 \*. For any other planet, on trial, a similar disagree-  
 “ ment will be found, and the proposition of computing from either  
 “ period must be erroneous. Moreover, of what use is it to make  
 “ computations for a space of time, when the planets and their motions  
 “ were not in being?

It might, however, from the foregoing circumstances, be imputed to  
 “ BRAHMAGUPTA and the rest, that they have given precepts through

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• Because	$\frac{2296828522 \times 17064000}{4320000000}$	=	Revolutions 9072472	S.	°	′	″
				7	28	0	16.

“ ignorance,

“ ignorance, or with intent to deceive : That, having stated the revo-  
 “ lutions of the planets different from the account revealed by SŪRYA,  
 “ they must certainly have been in error: That BRAHMAGUPTA  
 “ could not have counted the revolutions from the beginning of the  
 “ *Calpa* ; neither could he from the mean motion of the planets have so  
 “ determined them : he was a mortal, and therefore could not count the  
 “ revolutions.—Although the rule of proportion should be granted to  
 “ have served his purpose for the revolutions of the planets, yet  
 “ it certainly could not for those of their *Mandōchcha*, because it  
 “ was not within the term of a man’s life to determine the mean  
 “ motion of the *Mandōchcha* ; and this assertion is justified by the  
 “ opinion of BHA’SCHARA’CHARYA. But the rule of proportion could not  
 “ have answered even for the planets ; for, although their mean motion be  
 “ observed one day, and again the next, how can a man be certain of  
 “ the exact time elapsed between the two observations ? And if there be  
 “ the smallest error in the elapsed time, the rule of proportion cannot  
 “ answer for such great periods. An error of the  $\frac{1}{1000000}$  part of  
 “ a second (*Vicalā*) in one day, amounts to forty degrees \* in the com-  
 “ putation of a *Calpa*, and the mistake of  $\frac{1}{16}$  of a respiration in one  
 “ *Saura* year, makes a difference in the same period of 20000 days.  
 “ That it is therefore evident, BRAHMAGUPTA’s motive for directing  
 “ the planetary motions to be computed as commencing with the *Calpa*,  
 “ was to deceive mankind ; and that he had not the authority of the  
 “ *Munis*, because he differs from the *Sūrya Siddhanta*, *Brahma Siddhanta*,  
 “ *Sōma Siddhanta* ; from VASISHTHA and other *Munis*.

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\* The error would be more than 43°.

“ Such opinions would have no foundation, as I shall proceed  
 “ to show. BRAHMAGUPTA's rules are consistent with the practice of  
 “ the *Pandits* his predecessors; and he formed them from the *Purana*  
 “ *Vishnu Dhermottara*, wherein is contained the *Brahma Siddhanta*;  
 “ and the periods given by A'RYABHATTA are derived from the *Parifera*  
 “ *Siddhanta*: the precepts of the *Munis* are therefore the authorities of  
 “ BRAHMAGUPTA, A'RYABHATTA, and BHA'SCARA'CHA'RYA, whose  
 “ rules cannot be deceitful. The *Munis* themselves differed with regard to  
 “ the number of *Savan* days in a *Yug*, which is known from the *Pancha*  
 “ *Siddhanta*, composed by VARA A'CHA'RYA, wherein are proposed two  
 “ methods of computing the sun's place; the one according to the *Surya*  
 “ *Siddhanta*, the other according to the *Romacá Siddhanta*; whence it ap-  
 “ pears that there were different rules of computation even among the *Mu-*  
 “ *nis*. It is also mentioned in the *Ticá* on the *Varáha Sanhitá*, that, accord-  
 “ ing to the *Paulastya Siddhanta*, there was formerly a different number of  
 “ *Savan* days estimated in a *Yug*. The maxims therefore of BRAHMA-  
 “ GUPTA and the other two, agreeing with those of the *Munis*, are  
 “ right; but, should it even be supposed that the *Munis* themselves could  
 “ be mistaken, yet BRAHMAGUPTA and the other two had the sanction  
 “ of the *Vedas*, which in their numerous *Sác'has* (branches) have disagree-  
 “ ments of the same kind; and, according to the *Sacalya Sanhitá*, BRAHMA',  
 “ in the revelation he made to NA'RED, told him, although a circumstance  
 “ or thing were not perceptible to the senses, or reconcileable to reason,  
 “ if authority for believing it should be found in the *Vedas*, it must be  
 “ received as true.

“ If a planet's place, computed both by the *Surya Siddhanta* and  
 “ *Parafera Siddhanta*, should be found to differ, which rule must be re-  
 “ ceived

"ceived as right? I answer, that which agrees with his place by ob-  
 "servaion; and the *Munis* gave the same direction. If computations  
 "from the beginning of the *Calpa*, and from the period stated in the  
 " *Sūrya Siddhānta*, give a difference, as appears in the instance of *Mangala*,  
 " which of the two periods to be computed from is founded in truth?  
 " I say, it is of no consequence to us which, since our object is only  
 " to know which period answers for computation of the planetary places  
 " in our time, not at the beginning of the *Calpa*. The difference found  
 " in computing, according to BRAHMAGUPTA and the *Munis*, must be  
 " corrected by an allowance of *bija*; or by taking that difference as the  
 " *śhūlpa*; but the books of the *Munis* must not be altered, and the rules  
 " given by BRAHMAGUPTA, VARA'CHA'RYA, and A'RYABHATTA, may be  
 " used with such precautions. Any person may compose a set of rules  
 " for the common purposes of astronomy; but, with regard to the  
 " duties necessary in eclipses, the computation must be made by the books  
 " of the *Munis*, and the *bija* applied; and in this manner it was that  
 " VARA'HA, A'RYABHATTA, BRAHMAGUPTA, and CE'SAVA SAMVAT-  
 " SARA, having observed the planets and made due allowance of *bija*,  
 " composed their books.

" GANE'SA mentions that the *Grahas* were right in their computed  
 " places in the time of BRAHMA', A'CHA'RYA, VASISHT'HA, CASYAPA,  
 " and others, by the rules they gave; but in length of time they differed;  
 " after which, at the close of the *Satya* age, SU'RYA revealed to MEYA a  
 " computation of their true places. The rules then received answered  
 " during the *Tretā* and *Dwāpar* ages, as also did other rules formed  
 " by the *Munis* during those periods. In the beginning of the *Cali*  
 " *Yug*, PARA'SERA's book answered; but A'RYABHATTA, many years

“ after, having examined the heavens, found some deviation, and introduced a correction of *bija*. After him, when further deviations were observed, DURGA’ SINHA, MIHRA, and others, made corrections. After them came the sons of JISTNU and BRAHMAGUPTA, and made corrections. After them CE’SAVA settled the places of the planets; and sixty years after CE’SAVA, his son GANE’Sa made corrections.”

WE have now, according to the *Hindu* system, the mean motion of the planets, their nodes, and apides, and the elapsed time since they were in conjunction in the first of *Mésha*; with which, by the rule of proportion, to determine their mean longitude for any proposed time of the present year. It is however observed in the *Súrya Siddhánta*, that to assume a period so great is unnecessary; for use the computation may be made from the beginning of the *Trétà* age, at which instant all the *Grahas*, or moveable points in the heavens, were again in conjunction in *Mésha*, except the apogees and ascending nodes, which must therefore be computed from the creation. The same is true of the beginning of the present *Cali* age; for the greatest common divisor of the number of days composing the *Mahà Yug* and the planetary revolutions in that period, is four; which quotes 394479457 days, or 1080000 years; and the *Trétà* and *Dwápar* ages contain together twice that number of years. The present *Hindu* astronomers therefore find it unnecessary to go farther back than the beginning of the *Cali Yug*\* in determining

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\* Neither do they in computing by the formulas in common use go farther back than to some assigned date of the era *Saca*; but, having the planets places determined for that point of time, they compute their mean places and other requisites for any proposed date afterwards by tables, or by combinations of figures contrived to facilitate the work: as in *Gahalágháwa*, *Siddhánta Rahasya*, and many other books. An inquirer into *Hindu* astronomy having access to such books only, might easily be led to assert that the *Brahmans* compute eclipses by *set forms couched in enigmatical*

determining the mean longitude of the planets themselves; but for the position of their apsidæ and nodes, the elapsed time since the creation must be used; or at least in instances, as of the sun, when the numbers 387 and 432000000 are incommensurable but by unity. I have however in the accompanying computation, taken the latter period in both cases.

FOR the equation of the mean to the true anomaly, in which the solution of triangles is concerned, and which is next to be considered, the *Hindus* make use of a canon of sines constructed according to the *Sūrya Siddhānta*, in the following manner:—"Divide the number of minutes contained in one sine 1,800 by eight, the quotient 225 is the first *Jyāpinda*, or, the first of the twenty-fourth portions of half the string of the bow. Divide the first *Jyāpinda* by 225, the quotient 1' deduct from the dividend, and the remainder 224' add to the first for the second *Jyāpinda* 449'. Divide the second *Jyāpinda* by 225, the quotient being 1' and the fraction more than half a minute, deduct 2' from the foregoing remainder 224', and add the remainder so found to the second for the third *Jyāpinda* 671'. Divide this by 225', the quotient 3' deduct from the last remainder 222'; the remainder so found 219', add to the third for the fourth *Jyāpinda* 890. Divide this by 225', and the quotient deduct from the last remainder; the remainder so found add to the fourth, for the fifth *Jyāpinda* 1105, and proceed in this manner until the twenty-four *Crānāyās* \* are completed;

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where, out of which it would be difficult to develop their system of astronomy; and this I apprehend was the case with Monf. SONNERAT. The *Jyōtiṣ Pandits* in general, it is true, know little more of astronomy than they learn from such books, and they are consequently very ignorant of the principles of the science: but there are some to be met with, who are better informed.

\* *Crānāyās*, Right Sines.

“ which will be as follows:  $\overset{1}{225}$ ,  $\overset{2}{449}$ ,  $\overset{3}{671}$ ,  $\overset{4}{890}$ ,  $\overset{5}{1105}$ ,  $\overset{6}{1315}$ ,  $\overset{7}{1520}$ ,  
 $\overset{8}{1719}$ ,  $\overset{9}{1910}$ ,  $\overset{10}{2093}$ ,  $\overset{11}{2267}$ ,  $\overset{12}{2431}$ ,  $\overset{13}{2585}$ ,  $\overset{14}{2728}$ ,  $\overset{15}{2859}$ ,  $\overset{16}{2978}$ ,  $\overset{17}{3084}$ ,  
 $\overset{18}{3177}$ ,  $\overset{19}{3256}$ ,  $\overset{20}{3321}$ ,  $\overset{21}{3372}$ ,  $\overset{22}{3409}$ ,  $\overset{23}{3431}$ ,  $\overset{24}{3438}$ . For the *utramajyā* \*,  
the twenty-third *cramajyā* deducted from the *trijyā* or twenty-fourth  
*cramajyā*, leaves the first *utramajyā*; the twenty-second deducted  
from the twenty-third leaves the second *utramajyā*; the twenty-first  
from the twenty-second leaves the third; the twentieth from the  
twenty-first leaves the fourth. In the same manner proceed until the  
*utramajyās* are completed; which will be as follows:  $\overset{1}{7}$ ,  $\overset{2}{29}$ ,  $\overset{3}{66}$ ,  
 $\overset{4}{117}$ ,  $\overset{5}{182}$ ,  $\overset{6}{261}$ ,  $\overset{7}{354}$ ,  $\overset{8}{460}$ ,  $\overset{9}{579}$ ,  $\overset{10}{710}$ ,  $\overset{11}{853}$ ,  $\overset{12}{1007}$ ,  $\overset{13}{1171}$ ,  $\overset{14}{1345}$ ,  $\overset{15}{1528}$ ,  
 $\overset{16}{1719}$ ,  $\overset{17}{1928}$ ,  $\overset{18}{2123}$ ,  $\overset{19}{2233}$ ,  $\overset{20}{2548}$ ,  $\overset{21}{2767}$ ,  $\overset{22}{2989}$ ,  $\overset{23}{3213}$ ,  $\overset{24}{3438}$ .” So far the  
*Sūrya Siddhānta* on the subject of the sines. The commentator shows  
how they are geometrically constructed: “ With a radius describe a circle,  
the periphery of which divide into 21600 equal parts, or minutes.  
Draw (north and south, and east and west) lines through the centre;  
set off contrarywise from the east point, 225 on the periphery, and  
draw a string from those extremities across the *trijyā* †. The string  
is the *jyā*; and its half the *ardhajyā*, called *jivā*. The *Pandits* say,  
a planet’s place will correspond with the *ardhajyā*, by which, therefore,  
computations of their places are always made; and by the term *jyā*  
is always understood the *ardhajyā*. The first *jyā* will be found to  
contain 449 minutes, and the operation, repeated to twenty-four divi-  
sions, will complete the *cramajyā*. In each operation, the distance  
contained between the *jyā* and its arc, or that line which represents  
the arrow of a bow, must be examined, and the number of minutes

\* *Utramajyā*, Versed Sines.† *Trijyā*, the Radius.

“ therein contained taken for the *utcramajyà*. The circle may represent  
 “ any space of land ; the *bhujajya* \* is the *bhujà*, the *cotijyà* the *còti*, and  
 “ the *trijyà* the *carua*. The square of the *bhujajyà* deducted from the square  
 “ of the *trijyà*, leaves the square of the *cotijyà* ; the root of which is the *coti-*  
 “ *jya* ; and, in the same manner, from the *cotijyà* is determined the *bhujajyà*.  
 “ The *cotyutcramajyà* deducted from the *trijyà* leaves the *bhujacramajyà*.  
 “ The *bhucòtcramajyà* deducted from the *trijyà* leaves the *còtcramajyà*.  
 “ When the *bhujajyà* is the first division of the *trijyà*, the *cotijyà* is the  
 “ twenty-three remaining divisions ; which *cotijyà*, deducted from the *trijyà*,  
 “ leaves the *bhujòtcramajyà*. On this principle are the *jyas* given in the  
 “ text † : they may be determined by calculation also, as follows :

“ THE *trijyà* take as equal to 3438 minutes, and containing twenty-four  
 “ *jyàpindas* : its half is the *jyà* of one fine, or 1719', which is the eighth  
 “ *jyàpinda*, or the sixteenth *cotijyàpinda*. The square of the *trijyà* multiply  
 “ by three, and divide the product by four, the square root of the quotient  
 “ is the *jyà* of two fines, or 2977'. The square root of half the square of  
 “ the *trijyà* is the *jyà* of one fine and an half (45°) or 2431' ; which de-  
 “ ducted from the *trijyà*, leaves the *utcramajyà* 1007'. By this *utcramajyà*  
 “ multiply the *trijyà* ; the square root of half the product is the *jyà* of 22°,  
 “ 30', or 1315'. The square of this deduct from the square of the *trijyà*,  
 “ the square root of the difference is the *jyà* of 67°, 30', or 3177', which is  
 “ the *cotijyà* of 22°, 30', equal to 1315'. This *bhujajyà* and *cotijyà* deducted  
 “ severally from the *trijyà*, leaves the *utcramajyà* of each 2123' and 261'." &c.

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\* *Bhujajyà*, the sine ; *Cotijyà*, the sine complement.

† A diagram might here be added for illustration ; but it must be unnecessary to anyone who has the smallest knowledge of geometry.



THIS is sufficient to show that the *Hindus* have the right construction of the sines, although they do not appear, from any thing I can learn, have carried it farther than to twenty-four divisions of the quadrant the following table. Instances of the like inaccuracy will occur in the of this paper. The table of sines may perhaps be more clearly represented in the following manner :—

*Right Sines, the Radius containing 3438 Minutes.*

<i>Arc.</i>	<i>Sine.</i>	<i>Arc.</i>	<i>Sine.</i>	<i>Arc.</i>
1 <sup>st</sup> = 225' = 3°, 45'	225'	9 <sup>th</sup> = 2025' = 33°, 45'	4910'	17 <sup>th</sup> = 3825' = 63°, 45'
2 <sup>d</sup> = 450' = 7°, 30'	449	10 <sup>th</sup> = 2250' = 37°, 30'	2093	18 <sup>th</sup> = 4050' = 67°, 30'
3 <sup>d</sup> = 675' = 11°, 15'	671	11 <sup>th</sup> = 2475' = 41°, 15'	2267	19 <sup>th</sup> = 4275' = 71°, 15'
4 <sup>th</sup> = 900' = 15°, —	890	12 <sup>th</sup> = 2700' = 45°, —	2431	20 <sup>th</sup> = 4500' = 75°, —
5 <sup>th</sup> = 1125' = 18°, 45'	1105	13 <sup>th</sup> = 2925' = 48°, 45'	2585	21 <sup>st</sup> = 4725' = 78°, 45'
6 <sup>th</sup> = 1350' = 22°, 30'	1315	14 <sup>th</sup> = 3150' = 52°, 30'	2728	22 <sup>d</sup> = 4950' = 82°, 30'
7 <sup>th</sup> = 1575' = 26°, 15'	1520	15 <sup>th</sup> = 3275' = 56°, 15'	2850	23 <sup>d</sup> = 5175' = 86°, 15'
8 <sup>th</sup> = 1800' = 30°, —	1719	16 <sup>th</sup> = 3600' = 60°, —	2978	24 <sup>th</sup> = 5400' = 90°, —

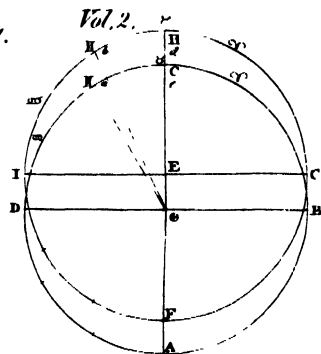
*Verfed Lines.*

<i>Arc.</i>	<i>Sine.</i>	<i>Arc.</i>	<i>Sine.</i>	<i>Arc.</i>
1 <sup>st</sup> = 225' = 3°, 45'	7	9 <sup>th</sup> = 2025' = 33°, 45'	579'	17 <sup>th</sup> = 3825' = 63°, 45'
2 <sup>d</sup> = 450' = 7°, 30'	29	10 <sup>th</sup> = 2250' = 37°, 30'	710	18 <sup>th</sup> = 4050' = 67°, 30'
3 <sup>d</sup> = 675' = 11°, 15'	66	11 <sup>th</sup> = 2475' = 41°, 15'	853	19 <sup>th</sup> = 4275' = 71°, 15'
4 <sup>th</sup> = 900' = 15°, —	117	12 <sup>th</sup> = 2700' = 45°, —	1007	20 <sup>th</sup> = 4500' = 75°, —
5 <sup>th</sup> = 1125' = 18°, 45'	182	13 <sup>th</sup> = 2925' = 48°, 45'	1171	21 <sup>st</sup> = 4725' = 78°, 45'
6 <sup>th</sup> = 1350' = 22°, 30'	261	14 <sup>th</sup> = 3150' = 52°, 30'	1345	22 <sup>d</sup> = 4950' = 82°, 30'
7 <sup>th</sup> = 1575' = 26°, 15'	354	15 <sup>th</sup> = 3275' = 56°, 15'	1528	23 <sup>d</sup> = 5175' = 86°, 15'
8 <sup>th</sup> = 1800' = 30°, —	460	16 <sup>th</sup> = 3600' = 60°, —	1719	24 <sup>th</sup> = 5400' = 90°, —

FOR the sines of the intermediate arcs, take a mean proportion between the tabular difference, as for the sine of 14°, which is between the

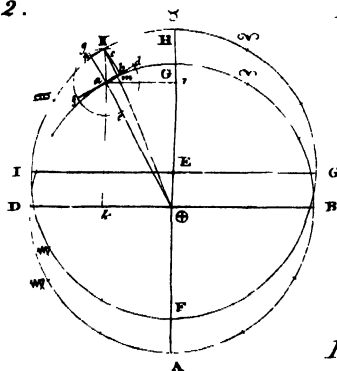


Fig. 1.



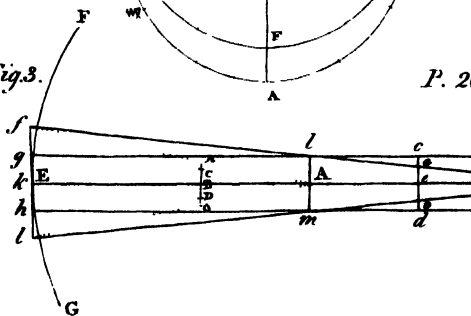
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Fig. 2.



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Fig. 3.



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225' being the difference of those arcs, and 219 the difference of their fines,  $\frac{165' \times 219''}{215} = 160', 36''$ , or a mean proportional number to be added to the fine of the third tabular arc, for the fine required of  $14^\circ$  or  $831' 36''$ . In the sexagesimal arithmetic, which appears to be universally used in the *Hindu* astronomy, when the fraction exceeds half unity, it is usually taken as a whole number: thus,  $831', 35'', 35'''$ , would be written  $831', 36''$ .

To account for the apparent unequal motion of the planets, which they suppose to move in their respective orbits through equal distances in equal times, the *Hindus* have recourse to eccentric circles, and determine the eccentricity of the orbits of the sun and moon with respect to that circle, in which they place the earth as the centre of the universe, to be equal to the fines of their greatest anomalous equations, and accordingly that the delineation of the path of either may be made in the following manner:—

DESCRIBE a circle, which divide as the ecliptic into signs, degrees, and minutes; note the place of the *Mandôchcha*, or higher apsis, which suppose in  $\gamma$ . Draw a diameter to that point, and set off, from the centre  $\odot$  towards the place of the apogee, the eccentricity equal to the fine of the greatest equation, which of the sun is  $130' 32''$ . Here the eccentricity is represented much greater, that the figure may be better understood. Round the point  $E$ , as the centre, describe the eccentric circle  $FGHI$ , which is the sun's orbit, and in the point  $H$ , where it is cut by the line  $\odot \gamma$  prolonged, is the place of the *Mandôchcha*, or higher apsis; and in the opposite point  $F$  is the lower. From the place of the apogee  $H$ , set off its longitude in reverse, or contrary to the order of the signs, for the

the beginning of *Aries*, and divide this circle, as the former, into signs and degrees. Note the sun's mean longitude in each circle, as suppose in *Gemini*, and from both points draw right lines to the earth at  $\oplus$ . According to the *Hindu* system, which appears to be the same as the *Ptolemaic*, the angle  $a \oplus C$  will be the mean anomaly, the angle  $b \oplus C$  the true anomaly, and the angle  $a \oplus b$  their difference, or the equation of the mean to the true place; to be subtracted in the first six signs of anomaly, and added in the last six. The *Europeans* in the old astronomy found the angle  $b \oplus C$ , by the following proportion, and which subtracted from  $a \oplus C$  left the equation, which, as the *Hindus*, they inserted in tables calculated for the several degrees of the quadrant; as the co-sine of the mean anomaly  $\oplus e = Ed$  added to the eccentricity  $E \oplus$ , is to the sine of the mean anomaly  $a e = b d$ , so is the radius to the tangent of the true anomaly: or, in the right angled triangle  $d \oplus b$ , in which are given  $d \oplus$  and  $b d$ , if  $d \oplus$  be made radius,  $b d$  will be the tangent of the angle  $b \oplus d$ , required. The *Hindus*, who have not the invention of *tangents*, take a different method, on principles equally true. They imagine the small circle or epicycle,  $cdef$ , drawn round the planet's mean place  $a$  with a radius equal to the eccentricity, which in this case of the sun is  $130' 30''$ , and whose circumference in degrees, or equal divisions of the deferent  $ABCD$ , will be in proportion as their semi-diameters; or, as  $\oplus C = 3438'$ , to  $ABCD = 360^\circ$ , so  $ag = 130' 32''$ , to  $efgd = 13^\circ 40'$ , which is called the *paridhi-ansa* or *paridhi* degrees. In the same proportion also will be the correspondent sines  $hc$  and  $ai$ , and their co-sines  $cb$  and  $lk$ , which are therefore known by computation, in minutes or equal parts of the radius  $a \oplus$ , which contains, as before mentioned,  $3438'$ . In the right angled triangle  $h \oplus c$ , right angled at  $h$ , there are given the sides  $h \oplus (= a \oplus + cb$ , because  $cb = ha$ ) and  $hc$ ; to find the hypotenuse  $c \oplus$ , by means of which the angle

$a \oplus m$  may be determined; for its sine is  $l m$ , and, in the similar triangles  $h c \oplus$  and  $l m \oplus$ , as  $c \oplus$  is to  $m \oplus$ , so is  $h c$  to  $l m$ , the sine of the angle of equation. From the third to the ninth sines of anomaly, the co-sine  $c b$  must be subtracted from the radius 3438' for the side  $h \oplus$ .

It is, however, only in computing the retrogradations and other particulars respecting the planets *Mercury*, *Venus*, *Mars*, *Jupiter*, and *Saturn*, where circles greatly eccentric are to be considered, that the *Hindus* find the length of the *carma*, or hypotenuse,  $c \oplus$ ; in other cases, as for the anomalistic equations of the sun and moon, they are satisfied to take  $h c$  as equal to the sine  $l m$ , their difference, as the commentator on the *Sûrya Siddhânta* observes, being inconsiderable.

UPON this hypothesis are the *Hindu* tables of anomaly computed with the aid of an adjustment, which, as far as I know, may be peculiar to themselves. Finding that, in the first degree of anomaly both from the higher and lower apsis, the difference between the mean and observed places of the planets was greater than became thus accounted for, they enlarged the epicycle in the apogee and perigee, proportionably to that observed difference; for each planet respectively, conceiving it to diminish in inverse proportion to the sine of the mean anomaly, until at the distance of three sines, or half way between those points, the radius of the epicycle should be equal to the eccentricity or sine of the greatest equation. This assumed difference in the magnitude of the epicycle they called the difference of the *paridhi ansa* between *vishama* and *sama*; the literal meaning of which is *odd* and *even*. From the first to the third sine of anomaly, or rather in the third, a planet is in *vishama*; from the

third to the sixth, or in the perigee, in *fama*; in the ninth sign, in *viśhama*, and in the twelfth, or the apogee, in *fama*. The *paridhi* degrees, or circumference of the epicycle in *fama* are of the sun  $14^\circ$ , in *viśhama*  $13^\circ 40'$ ; of the moon in *fama*  $32^\circ$ , in *viśhama*  $31^\circ 40'$ ; the difference assigned to each between *fama* and *viśhama*,  $20'$ .

To illustrate these matters by examples, let it be required to find the equation of the sun's mean to his true place in the first degree of anomaly. The sine of  $1^\circ$  is considered as equal to its arc, or 60. The circumference of the epicycle in *fama*, or the *apogee*, is  $14^\circ$ , but diminishing in this case towards *viśhama*, in inverse proportion to the sine of anomaly. Therefore, as radius 3438 is to the difference between *fama* and *viśhama*  $20'$ , so is the sine of anomaly  $60'$  to the diminution of the epicycle, in the point of anomaly proposed,  $20''$  ( $= \frac{60' \times 20'}{34}$ ) which subtracted from  $14^\circ$ , leaves  $13^\circ 59' 40''$ . Then, as the circumference of the great circle  $360^\circ$  is to the circumference of the epicycle  $13^\circ 59' 40''$ , so is the sine of anomaly  $60'$  to its correspondent sine in the epicycle *hc*, which, as was observed, is considered as equal to *lm*, or true sine of the angle of equation  $2^\circ 19' 56'''$  ( $= \frac{13^\circ 59' 40'' \times 60'}{360^\circ}$ ) which, in the *Hindu* canon of sines is the same as its arc, and is therefore the equation of the mean to the true place in  $1^\circ$  of anomaly, to be added in the first six sines, and subtracted in the last six.

For the equation of the mean to the true place in  $5^\circ 14'$  of anomaly. The sine of  $5^\circ 14'$  is  $313' 36'' 8'''$  and  $\frac{313' 36'' 8''' + 20'' = 6272' 2'' 48''}{3438} = 1' 49''$ , to be deducted from the *paridhi* degrees in *fama*.— $14^\circ 1' 49'' = 13^\circ 58' 11''$ , and  $\frac{313', 36'', 8''' + 13^\circ, 58', 11'' = 4379', 59'', 37''}{360^\circ} = 12^\circ 9' 59'''$  the sine of the angle of equation, which is equal to its arc.

FOR the same in 14° of anomaly. The sine of 14°, is 831. 36.— $\frac{811' 36'' \times 20'}{3438}$   
 $= 4' 50''$ , and  $\frac{14^\circ - 4' 50'' \times 831' 38''}{360^\circ} = 32' 9''$  the sine of the angle of equation.

FOR the same in two sines of anomaly. The sine of 60° is 2978'  
 $\frac{2978' \times 20'}{3438} = 17', 19''$ ; and  $\frac{14^\circ - 17', 19'' \times 2978'}{360^\circ} = 113' 25'' 20''$ , the sine of equation,  
 equal to its arc.

FOR the equation of the mean to the true place of the moon in 1° of anomaly. The *paridhi* degrees of the moon in *fama* are 32°, in *vishama* 31°, 40', the difference 20'. The sine of 1° is 60' and  $\frac{60' \times 20'}{3438} = 21''$  to be deducted from the *paridhi* degrees in *fama*, 32° — 21'' = 31° 59' 39".  
 $31^\circ, 59', 39'' \pm 60' = 5', 20''$ , the equation required.

FOR the same in ten degrees of anomaly. The sine of 10° is 597'  
 $\frac{597' \times 20'}{3438} = 3' 28''$ , and  $\frac{32^\circ - 3', 28'' \times 597'}{360^\circ} = 52' 38''$ , the equation required.

FOR the same in three sines of anomaly. The sine of 90° is the radius, or 3438', and  $\frac{3438' \times 20'}{3438} = 20$ ,  $\frac{32^\circ - 20' \times 3438'}{360^\circ} = 302', 25''$ , the sine of the greatest angle of equation, equal to the radius of the epicycle in this point of anomaly, the arc corresponding with which is 302' 45'', the equation required.

FOR the equation of the mean to the true motion in these several points of anomaly, say, as radius 3438, is to the mean motion, so is the co-sine *c b* of the anomalistic angle *g a c* in the epicycle, to the difference between the mean and apparent motion, or the equation re-



quired, to be subtracted from the mean motion in the first three lines of anomaly added in the next six, and subtracted in the last three.

EXAMPLE: For the sun in  $5^{\circ} 14'$  of anomaly. The co-sine of  $5^{\circ} 14'$  in the *Hindu* canon is  $3422' 17'' 52'''$ . The *paridhi* circle in this point found before, is  $13^{\circ} 58' 11''$ ; and  $\frac{3422, 17' 52'' + 13^{\circ} 58' 11''}{360^{\circ}} = 132' 48''$  the co-sine  $c b$  in the epicycle; then as radius  $3438'$  is to the sun's mean motion  $59' 8''$  per day, or  $59' 8'''$  per *danda*, so is the co-sine  $c b = 132' 48''$ , to the equation required,  $2' 17''$  per day, or  $2' 17'''$  per *danda*. The motion of the sun's apsis is so slow as to be neglected in these calculations; but that of the moon is considered, in order to know her mean motion from her apogee, which is  $783' 54''$ .

In this manner may be determined the equation of the mean to the true anomaly and motion for each degree of the quadrant, and which will be found to agree with the tables of *Macaranda*. The following tables are translated from that book :

Solar Equations, *Ravi p'hala*.

Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.	Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.	Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.	Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.		
0	0	'	"	'	"	0	0	'	"	'	"	0	0	'	"	0	0	'	"	'	"
1		2	20	2	18	31	1	8	—	1	55	61	1	54	30	1			1	4	
2		4	40	2	18	32	1	9	57	1	53	62	1	55	34	1			1		
3		7	—	2	18	33	1	11	57	1	53	63	1	56	35					58	
4		9	19	2	17	34	1	13	47	1	51	64	1	57	34					57	
5		11	37	2	17	35	1	15	40	1	51	65	1	68	34					55	
6		13	56	2	17	36	1	17	32	1	49	66	1	59	30					55	
7		16	15	2	16	37	1	19	23	1	47	67	2	—	23					52	
8		18	33	2	16	38	1	21	11	1	45	68	2	1	14					49	
9		20	51	2	15	39	1	22	57	1	43	69	2	2	4					46	
10		23	7	2	14	40	1	24	42	1	42	70	2	2	51					43	
11		25	23	2	14	41	1	26	26	1	40	71	2	3	35					41	
12		27	39	2	13	42	1	28	7	1	38	72	2	4	17					39	
13		29	55	2	13	43	1	29	46	1	36	73	2	4	57					37	
14		32	10	2	12	44	1	31	23	1	34	74	2	5	35					35	
15		34	24	2	11	45	1	32	58	1	32	75	2	6	12					32	
16		36	37	2	11	46	1	34	32	1	30	76	2	6	45					31	
17		38	39	2	10	47	1	36	4	1	29	77	2	7	17					28	
18		41	1	2	9	48	1	37	35	1	28	78	2	7	45					25	
19		43	12	2	8	49	1	39	6	1	28	79	2	8	12					23	
20		45	22	2	7	50	1	40	36	1	26	80	2	8	35					22	
21		47	31	2	6	51	1	42	3	1	23	81	2	8	58					20	
22		49	39	2	6	52	1	43	26	1	19	82	2	9	18					18	
23		51	47	2	5	53	1	44	45	1	16	83	2	9	36					15	
24		53	53	2	3	54	1	46	2	1	14	84	2	9	51					12	
25		55	57	2	2	55	1	47	17	1	13	85	2	10	3					10	
26		58	1	2	1	56	1	48	33	1	13	86	2	10	13					8	
27	1	—	2	2	—	57	1	49	47	1	12	87	2	10	20					6	
28	1	2	53	1	58	58	1	51	—	1	11	88	2	10	27					4	
29	1	4	3	1	57	59	1	52	12	1	11	89	2	10	31					1	
30	1	6	2	1	56	60	1	53	25	1	8	90	2	10	32						

Lunar Equations, *Chândra p'hala*.

Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.		Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.		Anomaly.	Eq. of the mean to the true place.			Eq. of the mean to the true motion.	
0	0	1	2	1	2	0	0	1	2	1	2	0	0	1	2	1	2
1		5	20	69	39	31	2	36	37	59	20	61	4	25	26	33	41
2		10	40	69	38	32	2	41	11	58	41	62	4	27	36	32	39
3		16	—	69	33	33	2	45	36	58	—	63	4	29	59	31	35
4		21	19	69	28	34	2	49	58	57	19	64	4	32	19	30	29
5		26	36	69	21	35	2	54	20	56	37	65	4	34	37	29	22
6		31	54	69	13	36	2	58	39	55	56	66	4	36	47	28	13
7		37	12	69	4	37	3	2	54	55	14	67	4	38	54	27	7
8		42	29	68	54	38	3	7	5	54	30	68	4	40	54	26	1
9		47	44	68	43	39	3	11	12	53	44	69	4	42	50	24	55
10		52	58	68	28	40	3	15	16	52	58	70	4	44	40	23	49
11		58	11	68	11	41	3	19	18	51	26	71	4	46	24	22	42
12	1	3	23	67	52	42	3	23	24	50	57	72	4	48	5	21	34
13	1	8	40	67	35	43	3	27	26	50	48	73	4	49	38	20	24
14	1	13	45	67	17	44	3	30	54	49	46	74	4	51	9	19	14
15	1	18	53	66	55	45	3	34	39	48	54	75	4	52	53	18	3
16	1	24	—	66	38	46	3	38	21	48	—	76	4	53	54	16	51
17	1	29	5	66	18	47	3	41	58	47	5	77	4	55	6	15	38
18	1	34	9	65	57	48	3	45	32	46	9	78	4	56	15	14	25
19	1	39	10	65	36	49	3	48	59	45	13	79	4	57	17	13	14
20	1	44	9	65	14	50	3	52	24	44	19	80	4	58	13	12	3
21	1	49	17	64	50	51	3	55	46	43	27	81	4	59	6	10	53
22	1	54	3	64	24	52	3	59	2	42	32	82	4	59	53	9	41
23	1	58	3	63	56	53	4	2	13	41	37	83	5	—	27	8	34
24	2	3	47	63	24	54	4	5	18	40	41	84	5	1	8	7	14
25	2	8	35	62	53	55	4	8	18	39	44	85	5	1	40	6	2
26	2	13	22	62	22	56	4	11	16	38	47	86	5	2	3	4	51
27	2	18	6	61	48	57	4	14	11	37	50	87	5	2	20	3	40
28	2	22	47	61	13	58	4	17	—	36	51	88	5	2	36	2	37
29	2	27	35	60	35	59	4	19	46	35	48	89	5	2	44	1	44
30	2	32	2	59	56	60	4	22	29	34	48	90	5	2	48	—	—

HAVING the true longitude of the sun and moon, and the place of the node, determined by the methods explained, it is easy to judge, from the position of the latter, whether at the next conjunction or opposition there will be a solar or a lunar eclipse; in which case the *tithi*, or date of the moon's synodical month, must be computed from thence, to determine the time counted from midnight of her full or change. Her distance in longitude from the sun, divided by  $720'$ , the minutes contained in a *tithi*, or the thirtieth part of  $360^\circ$ , the quotient shows the *tithi* she has passed, and the fraction, if any, the part performed of the next; which, if it be the fifteenth, the difference between that fraction and  $720'$  is the distance she has to go to her opposition, which will be in time proportioned to her actual motion; and that time being determined, her longitude, the longitude of the sun, and place of the node may be known for the instant of full moon, or middle of the lunar eclipse. The *Hindu* method of computing these particulars is so obvious in the accompanying instance, as to require no further description here; and the same may be said with respect to the declination of the sun and the latitude of the moon.

It is evident, from what has been explained, that the *Pandits*, learned in the *Jyotish Śāstra*, have truer notions of the form of the earth and the economy of the universe than are ascribed to the *Hindus* in general; and that they must reject the ridiculous belief of the common *Brāhmins*, that eclipses are occasioned by the intervention of the monster *Rāhu*; with many other particulars equally unscientific and absurd. But, as this belief is founded on explicit and positive declarations contained in the *Vēdas* and *Purānas*, the divine authority of which writings no devout *Hindu* can dispute, the astronomers have some of them cautiously explained such passages in those writings

writings as disagree with the principles of their own science, and, where reconciliation was impossible, have apologized, as well as they could, for propositions necessarily established in the practice of it, by observing that certain things, as stated in other *Sāstras*, “ might have been so formerly, “ and may be so still ; but for astronomical purposes, astronomical rules must “ be followed.” Others have with a bolder spirit attacked and refuted unphilosophical opinions. BHĀSCARA argues, that it is more reasonable to suppose the earth to be self-balanced in infinite space; than that it should be supported by a series of animals, with nothing assignable for the last of them to rest upon; and NERASINHA, in his commentary, shows that by *Rāhu* and *Cētu*, the head and tail of the monster, in the sense they generally bear, could only be meant the position of the moon’s nodes, and the quantity of her latitude, on which eclipses do certainly depend ; but he does not therefore deny the reality of *Rāhu* and *Cētu* ; on the contrary, he says, that their actual existence and presence in eclipses ought to be believed, and may be maintained as an article of faith, without any prejudice to astronomy. The following *Śloka*, to which a literal translation is annexed, was evidently written by a *Jyōtiṣh*, and is well known to the *Pandits* in general :

*Vip’halānyanyasāstrāni, vivādaśēṣhu cēvalam :*

*Sap’halam jyōtiṣham s’āstram, chandrārcau yatra śūcṣhinau.*

FRUITLESS are all other *Sāstras* ; in them is contention only : Fruitful is the *Jyōtiṣh Sāstra*, where the sun and moon are two witnesses.

THE argument of VARA’HA ACHA’RYA concerning the monster *Rāhu*, might here be annexed, but, as this paper will without it be sufficiently prolix,

lix, I shall next proceed to show how the astronomical *Pandits* determine the moon's distance and diameter, and other requisites for the prediction of a lunar eclipse.

THE earth they consider as spherical, and imagine its diameter divided into 1600 equal parts or *Yójanas*. An ancient method of finding a circle's circumference was to multiply the diameter by three; but this being not quite enough, the *Munis* directed that it should be multiplied by the square root of ten. This gives for the equatorial circumference of the earth in round numbers 5059 *Yójanas*, as it is determined in the *Súrya Siddhánta*. In the table of sines, however, found in the same book, the radius being made to consist of 3438 equal parts or minutes, of which equal parts the quadrant contains 5400, implies the knowledge of a much more accurate ratio of the diameter to the circumference; for by the first it is as 1. to 3. 1627, &c. by the last, as 1. to 3. 14136; and it is determined by the most approved labours of the *Europeans*, as 1. to 3. 14159, &c. In the *Puránas* the circumference of the earth is declared to be 500,000,000 *Yójanas*; and to account for this amazing difference, the commentator before quoted thought "the *Yójan* stated in the *Súrya Siddhánta* contained each 100,000 of those meant in the *Puránas*; "or perhaps, as some suppose, the earth was really of that size in some "former *Calpa*: moreover, others say, that from the equator southward "the earth increases in bulk: however, for astronomical purposes, the dimensions given by *SÚRYA* must be assumed." The equatorial circumference being assigned, the circumference of a circle of longitude in any latitude is determined. As radius 3438 is to the *Lambajya* or sine of the polar distance, equal to the complement of the latitude to ninety degrees, so is the equatorial dimension 5059, to the dimension in *Yójanas* required.

OF a variety of methods for finding the latitude of a place, one is by an observation of the *palabhà*, or shadow, projected from a perpendicular *Gnomon* when the sun is in the equator. The *Sancu* or *Gnomon* is twelve *angulus* or digits in length, divided each into sixty *vingulas*; and the shadow observed at *Benares* is  $\frac{A}{V} 5, 45$ . Then, by the proportion of a right angled triangle  $\sqrt{12^2 + 5.45^2} = \frac{A}{V} 13, 18$  the *acsha-carna* (hypotenuse) or distance from the top of the *Gnomon* to the extremity of the shadow; which take as radius, and the projected shadow will be the sine of the zenith distance, in this case equal to the latitude of the place  $\frac{A}{V} \frac{3438' + 6.45}{13, 18} = 1487'$  the arc corresponding with which, in the canon of sines, is  $25^\circ 26'$ , the latitude of *Benares*. The sine complement of the latitude is  $3101' 57''$ ; and again by trigonometry  $\frac{3101' 57'' + 6.59 38}{3438} = 4565, 4$  *Yogans*, the circumference of a circle of longitude in the latitude of *Benares*.

THE longitude is directed to be found by observation of lunar eclipses calculated for the first meridian, which the *Sūrya Siddhānta* describes as passing over *Lancā Rōhitaca*, *Avanti*, and *Sannihita-saras*. *Avanti* is said by the commentator to be “now called *Ujjayini*,” or *Ougein*: a place well known to the *English* in the *Mahratta* dominions. The distance of *Benares* from this meridian is said to be sixty-four *Yōjan* eastward; and as 4565 *Yōjan*, a circle of longitude at *Benares*, is to sixty *dandas*, the natural *Danda Pala* day, so is sixty-four *Yōjan* to 0.50, the difference of longitude in time which marks the time after midnight, when, strictly speaking, the astronomical day begins at *Benares* \*. A total lunar eclipse was observed to happen

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\* “This day (*astronomical day*) is accounted to begin at midnight under the *rāc'hā* (meridian) of *Lancā*; and at all places east or west of that meridian, as much sooner or later as is their

happen at *Benares* fifty-one *palas* later than a calculation gave it for *Lancá*, and  $\frac{51+45654}{60} =$  sixty-four *Yojana*, the difference of longitude on the earth's surface.

ACCORDING to RENNEL's Map, in which may be found *Ougein*, and agreeably to the longitude assigned to *Benares*, the equinoctial point *Lancá* falls in the eastern ocean southward from *Ceylon* and the *Maldiva Islands*. *Lancá* is fabulously represented as one of four cities built by *Dévatás* at equal distances from each other, and also from *Suméru* and *Bádarvinal*, the north and south poles, whose walls are of gold, &c. and with respect to MEYA's performing his famous devotions, in reward of which he received the astronomical revelations from the sun, recorded in the *Súrya Siddhánta*, the commentator observes, " he performed those devotions in " *Sálmala*, a country a little to the eastward of *Lancá*. The dimensions " of *Lancá* are equal to one-twelfth part of the equatorial circumference " of the earth," &c. Hence perhaps on inquiry may be found whether by *Sálmala* is not meant *Ceylon*. In the history of the war of RA'MA with RA'WAN, the tyrant of *Lancá*, the latter is said to have married the daughter of an *Afura*, named MEYA. But these disquisitions are foreign to my purpose.

FOR the dimensions of the moon's *cacshá* (orbit) the rule in the *Sanskrit* text is more particular than is necessary to be explained to any person who has informed himself of the methods used by *European* astrono-

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" *difántera* (longitude) reduced to time, according to the *Súrya Siddhánta*, *Brahma Siddhánta*, " *Váshishtha Siddhánta*, *Sóma Siddhánta*, *Paráśara Siddhánta*, and *Aryabhatta*. According to *Brah-* " *magupta* and others, it begins at sunrise; according to the *Rómaca* and others, it begins at " noon; and according to the *A'sha Siddhánta*, at sunset." (*Tica* on the *Súrya Siddhánta*.)



mers to determine the moon's horizontal parallax. In general terms, it is to observe the moon's altitude, and thence with other requisites to compute the time of her ascension from the sensible *cshitiya*, or horizon, and her distance from the sun when upon the rational horizon, by which to find the time of her passage from the one point to the other; or, in other words, 'to find the difference in time between the meridian to which the eye referred her at rising, and the meridian she was actually upon;' in which difference of time she will have passed through a space equal to the earth's semidiameter, or 800 *Yojan*: and by proportion, as that time is to her periodical month, so is 800 *Yojan* to the circumference of her *cacshà*, 324000 *Yojan*. The errors arising from refraction, and their taking the moon's motion as along the sine instead of its arc, may here be remarked; but it does not seem that they had any idea of the first\*; and the latter they perhaps thought too inconsiderable to be noticed. Hence it appears that they made the horizontal parallax  $53' 20''$ ; and her distance from the earth's centre 51570 *Yojan*; for  $\frac{1800 + 1600}{324000} = 53' 20''$ ; and as  $90^\circ$  or 5400' is to the radius 3438', so is one-fourth of her orbit 81000 *Yojan* to 51570, and  $\frac{51570 \times 21600}{5059} = 220184$ , the same distance in geographical miles. European astronomers compute the mean distance of the moon about 240000, which is something above a fifteenth part more than the *Hindus* found it so long ago as the time of MEYA, the author of the *Sûrya Siddhânta*.

By the *Hindu* system the planets are supposed to move in their respective orbits at the same rate; the dimensions therefore of the moon's orbit

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\* But they are not wholly ignorant of optics: they know the angles of incidence and reflection to be equal, and compute the place of a star or planet as it would be seen reflected from water or a mirror.

being known, those of the other planets are determined, according to their periodical revolutions, by proportion. As the sun's revolutions in a *Mahá Yug* 4320000 are to the moon's revolutions in the same cycle 5753336, so is her orbit 324000 *Yójan* to the sun's orbit 4331500 *Yójan*; and in the same manner for the *cacshás* or orbits of the other planets. All true distance and magnitude derivable from parallax, is here out of the question; but the *Hindu* hypothesis will be found to answer their purpose in determining the duration of eclipses, &c.

For the diameters of the sun and moon, it is directed to observe the time between the appearance of the limb upon the horizon and the instant of the whole disc being risen, when their apparent motion is at a mean rate, or when in three lines of anomaly; then, by proportion, as that time is to a natural day, so are their orbits to their diameters respectively, which of the sun is 6500 *Yójan*; of the moon 480 *Yójan*. These dimensions are increased or diminished, as they approach the lower or higher apsis, in proportion as their apparent motion exceeds or falls short of the mean, for the purpose of computing the diameter of the earth's shadow at the moon, on principles which may perhaps be made more intelligible by a figure.

LET the earth's diameter be  $lm=gh=cd$ ; the distance of the moon from the earth  $AB$ , and her diameter  $CD$ . By this system, which supposes all the planets moving at the same rate, the dimensions of the sun's orbit will exceed the moon's, in proportion as his period in time exceeds hers; let his distance be  $AE$ , and  $EFG$  part of his orbit. According to the foregoing computation also, the sun's apparent diameter  $fi$ , at this distance from the earth, is 6500 *Yójan*, or rather, the angle his diameter subtends,

subtends, when viewed in three fines of anomaly, would be 6500 parts of the circumference of a circle consisting of 4331500, and described round the earth as a centre with a radius equal to his mean distance, which is properly all that is meant by the *vishcambha*, and which, therefore, is increased or diminished according to his equated motion. This in three fines of anomaly is equivalent to  $32' 24''$ ; for, as 4331500 is to  $360^\circ$ , so is 6500 to  $32' 24''$ . The *Europeans* determine the same to be  $32' 22''$ . In the same manner the sun's *vishcambha* in the mean *cachà* of the moon, or the portion of her orbit in *Yojans*, included in this angle, is found as 4331500 is to 324000, so is 6500 to 486 *Yojan* or *n, o*, of use in solar eclipses; but this I am endeavouring to explain is a lunar one. It is evident that the diameter of the earth's shadow at the moon will be  $c, d, — c, a, + b, d$ , or  $a b$  when her distance is  $A e$ ; and that  $c a$  and  $b d$  will be found by the following proportion: as  $A k$  is to  $f i — g h = f g + h i$ , so is  $A e$  to  $c a + b d$ . But it has been observed that  $A k$  and  $f i$  are proportioned by the *Hindus* according to the moon's distance  $A e$ , the apparent motion of the sun and moon, and the angles subtended by their diameters. The *Hindu* rule therefore states, as the sun's *vishcambha*, or diameter, is to the moon's, so is the difference of the diameters of the sun and earth in *Yojans*, to a fourth number, equal to  $c a + b d$  to be subtracted from the *fuchì*, or  $lm = cd$  to find  $ab$ ; also, that the number of *Yojans*, thus determined as the diameters of the moon and shadow, may be reduced to minutes of a great circle by a divisor of fifteen. For, as the minutes contained in  $360^\circ = 21600$  are to the moon's orbit in *Yojan* 324000, so is one minute to fifteen *Yojan*.

THE diameter of the moon's disc, of the earth's shadow, and the place of the node being found for the instant of opposition, or full moon, the  
 remaining

remaining part of the operation differs in no respect, that I know of, from the method of *European* astronomers to compute a lunar eclipse. The translation of the formula for this purpose in the *Sūrya Siddhantā* is as follows : — “ The earth’s shadow is always six signs distant from *Sūrya*, “ and *Chandra* is eclipsed whenever at the *pūrnimā* the *pāta* is found “ there ; as is also *Sūrya*, whenever at the end of the *amāvāsya* the *pāta* “ is found in the place of *Sūrya* ; or, in either case, when the *pāta* is “ nearly so situated. At the end of the *amāvāsya* *ti’hi*, the signs, degrees, “ and minutes of *Sūrya* and *Chandra* are equal ; and at the end of the “ *pūrnimā* *ti’hi* the difference is exactly six signs : take therefore the “ time unexpired of either of those *ti’his*, and the motion for that “ time add to the *madhyama*, and the degrees and minutes of *Sūrya* and “ *Chandra* will be equal. For the same instants of time compute “ the place of the *pāta* in its retrograde motion ; and, if it should be in “ conjunction with *Sūrya* and *Chandra*, then, as from the intervention “ of a cloud, there will be an obscurity of *Sūrya* or of *Chandra*. “ *Chandra*, from the west, approaches the earth’s shadow, which on en- “ tering he is obscured : For the instant of the *pūrnimā*, from the “ half sum of the *chandramāna* and the *tamōlīptamāna* subtract the “ *viśhēpa*, the remainder is the *ch’channa*. If the *ch’channa* is greater \* “ than the *grāhyamāna*, the eclipse will be total ; and if less, the “ eclipse will be proportionally less. The *grāhya* and *grāhaca* deduct “ and also add ; square the difference and the sum severally ; subtract “ the square of the *viśhēpa* from each of those squares, and the square “ root of each remainder multiply by sixty ; divide each product by “ the difference of the *gata* of *Sūrya* and *Chandra* ; the first quotient

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\* Or, when the *ch’channa* and *grāhyamāna* are equal, the eclipse is total.

“ will be half the duration of the eclipse in *dandas* and *palas*; and  
 “ the second quotient will be half the *vimardárdha* duration in *dandas*  
 “ and *palas*,” &c. The *ch'channa*, or portion of the disc eclipsed, is here  
 found in degrees and minutes of a great circle; it may also be estimated in  
*digits*; but the *angulas* or digits of the *Hindus* are of various dimensions in  
 different books.

THE beginning, middle, and end of the eclipse may now be supposed found for the time in *Hindu* hours, when it will happen after midnight; but for the corresponding hour of the civil day, which begins at sun-rise, it is further necessary to compute the length of the artificial day and night; and for this purpose must be known the *ayanánfa*, or distance of the vernal equinox from the first of *mésa*, the sun's right ascension and declination: which several requisites shall be mentioned in their order.

RESPECTING the precession of the equinoxes and place of the colure, the following is a translation of all I can find on the subject in the *Súrya Siddhánta* and its commentary.

TEXT. “ The *ayanánfa* moves eastward thirty times twenty in each  
 “ *Mahá Yug*; by that number (600) multiply the *ahargana* (number of  
 “ mean solar days for which the calculation is made) and divide the pro-  
 “ duct by the *śávan* days in a *Yug*, and of the quotient take the *bhujá*,  
 “ which multiply by three, and divide the product by ten; the quotient  
 “ is the *ayanánfa*. With the *ayanánfa* correct the *graha*, *cránti*, the  
 “ *ch'háyà*, *charadula*, and other requisites, to find the *pustti* and the two  
 “ *viskruvas*. When the *carna* is less than the *súrya ch'háyà*, the *prác-*  
“ *chacra*

“ *chakra* moves eastward, and the *ayanánfa* must be added; and when  
 “ more, it moves westward, and the *ayanánfa* must be subtracted.

COMMENTARY. “ By the text, the *ayana bhagana* is understood to consist  
 “ of 600 *bhaganas* (periods) in a *Mahá Yug*; but some persons say the mean-  
 “ ing is thirty *bhaganas* only, and accordingly that there are 30000 *bhaga-*  
 “ *nas*. Also that BHA'SCAR ACHA'RYA observes, that, agreeably to what  
 “ has been delivered by *Súrya*, there are 30000 *bhaganas* of the *ayanánfa* in  
 “ a *Calpa*. This is erroneous; for it disagrees with the *Sástras* of the *Rishis*.  
 “ The *Sácalya Sanhitá* states that the *bhaganas* of the *Cránti páta* in a *Mahá*  
 “ *Yug* are 600 eastward. The same is observed in the *Váísht'ha Siddhánta*;  
 “ and the rule for determining the *ayanánfa* is as follows: The expired years  
 “ divide by 600, of the quotient make the *bhuja*, which multiply by three,  
 “ and divide the product by ten. The meaning of the BHA'SCAR ACHA'-  
 “ RYA was not that *SÚRYA* gave 30000 as the *bhaganas* of the *ayanánfa* in a  
 “ *Calpa*, the name he used being *Saura*, not *Súrya*, and applied to some other  
 “ book. From the *natánfa* is known the *crántyanfa*, and from the *crántijyá*  
 “ the *bhujajyá*, the arc of which is the *bhujánfa* of *Súrya*, including the *aya-*  
 “ *nánfa*: this for the first three months; after which, for the next three  
 “ months, the place of *Súrya*, found by this mode of calculation, must be  
 “ deducted from six signs. For the next three months the place of *Súrya*  
 “ must be added to six signs; and for the last three months, the place of *Sú-*  
 “ *rya* must be deducted from twelve signs. Thus from the shadow may be  
 “ computed the true place of *Súrya*. For the same instant of time compute  
 “ his place by the *ahargana*, from which will appear whether the *ayanánfa* is  
 “ to be added or subtracted. If the place found by the *ahargana* be less  
 “ than the place found by the shadow, the *ayanánfa* must be added. In the  
 “ present time the *ayanánfa* is added. According to the author of the

“ *Varasanhita*, it was said to have been deducted \*; and the southern  
 “ *ayanánśu* of *Súrya* to have been in the first half of the *naśhatra Aśleṣhā* †;  
 “ and the northern *ayana* in the beginning of *Dhanishṭa*: that in his time  
 “ the southern *ayana* was in the beginning of *Carcata*, or Cancer; and the  
 “ northern in the beginning of *Mancara*, or Capricorn.

“ THE *bhaganas* of the *ayanánśu* in a *Mahá Yug* are 600, the *śaura*  
 “ years in the same period 4320000; one *bhagana* of the *ayanánśu* there-  
 “ fore contains 7,200 years. Of a *bhagana* there are four *pádas*. First  
 “ *páda*: When there was no *ayanánśu*; but the *ayanánśu* beginning from  
 “ that time and increasing, it was added. It continued increasing 1,800  
 “ years; when it became at its utmost, or twenty-seven degrees. Second  
 “ *páda*: After this it diminished; but the amount was still added, until, at  
 “ the end of 1,800 years more, it was diminished to nothing. Third *páda*:

\* “ It was said to have been formerly *rma*.” In the *Hindu* species arithmetic, or algebra, *dhana* signifies affirmation or addition, and *rina* negation or subtraction: the sign of the latter is a point placed over the figure, or the quantity noted down; thus, 4 added to 7, is equal to 3. See the *bija ganita*, where the mode of computation is explained thus: When a man has four pieces of money, and owes seven of the same value, his circumstances reduced to the form of an equation, or his books balanced, show a deficiency of three pieces.

† This describes the place of the solstitial colure; and according to this account of the *ayanánśu*, the equinoctial colure must then have passed through the tenth degree of the *naśhatra Bharani* and the 3° 20' of *Vṛśākhā*. The circumstance, as it is mentioned in the *Vara Sanhita*, is curious and deserving of notice. I shall only observe here, that, although it does not disagree with the present system of the *Hindus* in regard to the motion of the equinoctial points, yet the commentator of the *Varasanhita* supposes that it must have been owing to some preternatural cause. The place here described of the colure is, on comparison of the *Hindu* and *European* spheres, about 3° 40' eastward of the position which it is supposed by Sir I. NEWTON, on the authority of EUDOXUS, to have had in the *primitive* sphere at the time of the Argonautic expedition.

“ The

“ The *ayanānśa* for the next 1,800 years was deducted; and the amount  
 “ deducted at the end of that term was twenty-seven degrees. *Fourth*  
 “ *pāda*: The amount deduction diminished; and at the end of the next term  
 “ of 1,800 years, there was nothing either added or subtracted. The  
 “ *Munis*, having observed these circumstances, gave rules accordingly:  
 “ If in the *śavan* days of a *Mahā Yuga* there are 600 *bhaganas*, what will  
 “ be found in the *ahargana* proposed? Which statement will produce *bhaga-*  
 “ *nas*, signs, &c. reject the *bhaganas*, and take the *bhujā* of the remainder,  
 “ which multiply by three and divide by ten, because there are four *pādus*  
 “ in the *bhagana*; for if in 90° there is a certain number found, as the *bhujā*,  
 “ when the *bhujā* degrees are twenty-seven, what will be found? And the  
 “ numbers twenty-seven and ninety used in the computation, being in the  
 “ ratio of three to ten, the latter are used to save trouble.

“ THERE is another method of computing the *ayanānśa*; the *crānti pāta-*  
 “ *gati* is taken at one minute per year; and according to this rule the *ayanānśa*  
 “ increases to twenty-four degrees; the time necessary for which, as *one pāda*,  
 “ is 1440 years. This is the *gati* of the *nacshatras* of the *crānti mandala*.

“ THE *nacshatra Rēvati* rises where the *nārī manikula* and the *śhītiḷa*  
 “ intersect \*, but it has been observed to vary twenty-seven degrees north  
 and

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\* This can happen only when there is no *ayanānśa*. The *vāri mandala* is the equator. The *yōga* star of *Rēvati* is in the last of *Mina* (Pisces) or, which is the same, in the *śrīst* of *Mīḷa* (Aries) and has no latitude in the *Hindu* tables. Hence from the *ayanānśa* and the time of the beginning of the *Hindu* year may be known their zodiacal stars. *Rēvati* is the name of the twenty-seventh *Lunar* mansion, which comprehends the last 13° 20' of *Mina*. When the *ayanānśa* was 0, as at the creation, the beginning of the *Cali Yuga*, &c. the colure passed through the *yōga* star of *Rēvati*. It is plain, that in this passage *Rēvati* applies either to the particular



“ and south. The same variation is observed in the other *naçhatras* :  
 “ it is therefore rightly said, that the *çacra* moves eastward. The *çacra*  
 “ means all the *naçhatras*. The planets are always found in the *naçhatras* ;  
 “ and the *crânti pâta-gali* is owing to them, not to the planets ; and hence  
 “ it is observed in the text, that the *pâtu* draws *chandra* to a distance equal  
 “ to the *crânti* degrees.”

HERE, to my apprehension, instead of a revolution of the equinoxes through all the signs in the course of the *Platonic* year, which would carry the first of *Vaiçac'h* through all the seasons, is clearly implied a libration of those points from the third degree of *Pisces* to the twenty-seventh of *Aries*, and from the third of *Virgo* to the twenty-seventh of *Libra* and back again in 7,200 years ; but as this must seem to *Europeans* an extraordinary circumstance to be stated in so ancient a treatise as the *Sûrya Siddhânta*, and believed by *Hindu* astronomers ever since, I hope the above quotations may attract the attention of those who are qualified for a critical examination of them, and be compared with whatever is to be found in other *Sâstras* on the same subject. Whatever may be the result of such an investigation, there is no mistaking the rule for determining the *ayanâñsâ*, which was at the beginning of the present year  $19^{\circ} 21'$ , and consequently the vernal equinox in *Pisces*  $10^{\circ} 39'$ , of the *Hindu* sphere ; or, in other words, the sun entered *Mêsha* or *Aries*, and the *Hindu* year began when he was advanced  $19^{\circ} 21'$  into the northern signs, according to *European* expression.

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particular *yôga* star of that name, or to the last, or twenty-seventh *Lunar* mansion, in which it is situated. See a former note. In each *naçhatra*, or planetary mansion, there is one star called the *yôga*, whose latitude, longitude, and right ascension the *Hindus* have determined and inserted in their astronomical tables.

THE *ayandya* added to the sun's longitude in the *Hindu* sphere, gives, his distance from the vernal equinox : of the sum take the *bhuja*, that is, if it exceeds three signs, subtract it from six signs ; if it exceeds six signs, subtract six from it ; and if it exceeds nine signs, subtract it from twelve. The quantity so found will be the sun's distance from the nearest equinoctial point from which is found his declination—as radius is to the *paramāpacramajyā*, or sine of the greatest declination  $24^{\circ}$ , so is the sun's distance from the nearest equinoctial point to the declination sought ; which will agree with the table of declination in present use, to be found in the tables of *Macaranda*, and calculated for the several degrees of the quadrant. The declination thus determined for one sign, two signs, and three signs, is  $11^{\circ} 43'$ ,  $20^{\circ} 38'$  ; and the greatest declination, or the angle of inclination of the ecliptic and equator,  $24^{\circ}$ . The co-sines of the same in the *Hindu* canon are  $3366'$ ,  $3217'$  and  $3141'$  ; and as the co-sine of the declination for one sign is to the co-sine of the greatest declination, so is the sine of  $30^{\circ}$  to the sine of the right ascension for a point of the ecliptic at that distance from either of the two *visuvas*, or equinoctial points. In this manner is found the right ascension for the twelve signs of the ecliptic reckoned from the vernal equinox ; and also, by the same management of triangles, the ascensional difference and oblique ascension for any latitude : which several particulars are inserted in the *Hindu* books as in the following table, which is calculated for *Bhagalpur* on supposition that the *pala-bhā*, or equinoctial shadow, is  $5^{\text{A}} 30^{\text{V}}$ . By the *Lagna* of *Lancā*, *Madhyama*, or mean *Lagna*, the *Hindus* mean those points of the equator which rise respectively with each thirtieth degree of the ecliptic counted from *Aries* in a right sphere, answering to the right ascension nine by latitude ; by the *Lagna* of a particular place, the oblique ascension, or the divisions of the equator which rise in succession with each sign in an oblique sphere ; and by the *chara*, the ascensional difference.

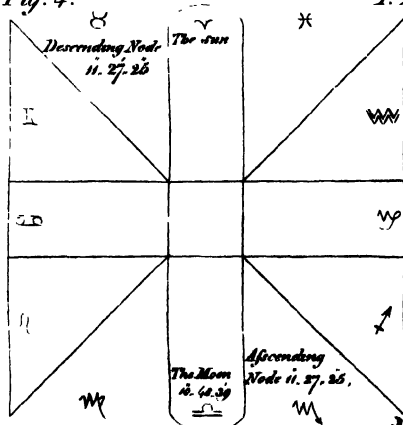
Signs.	Lagna of Lancà.		Chara of Bhagalpur.		Ullagna.	
Hindo Names.	In respirations answering to minutes of the equator.	In palas or mi- nutes of time 3600 to a Nac- shatra Day.	In respirations answering to minutes of the equator.	In palas of minutes of time 3600 to a Nac- shatra day	In respirations answering to minutes of the equator	In palas or mi- nutes of time 3600 to a Nac- shatra day.
Méfha	1670	278	327	55	1343	224
Vrifha,	1795	299	268	45	1527	255
Mit'huna,	1935	323	110	18	1825	304
Carcata,	1935	323	110	18	2045	341
Sinha,	1795	299	268	45	2063	343
Canyà,	1670	278	327	55	1997	333
Tulà,	1670	278	327	55	1997	333
Vrifchica,	1795	299	268	45	2063	343
Dhanus,	1935	323	110	18	2045	341
Macara,	1935	323	110	18	1825	304
Cumbha,	1795	299	268	45	1527	255
Mína,	1670	278	327	55	1343	224
	21600	3600			21600	3600



Fig. 4.

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瞻彼淇水 采芣苢兮  
有斐君子 知切如磋  
如琢如磨 瑟兮僖兮  
赫兮咺兮 有斐君子  
終不可詒

## THE COMPUTATION OF THE ECLIPSE.

LET it be premised that the position of the sun, moon, and nodes, by calculation, will on the first of next *Vaiśākh* be as here represented in the *Hindu* manner, excepting the characters of the signs.

By inspection of the figure, and by considering the motion of the sun, moon, and nodes, it appears, that, when the sun comes to the sign *Tulā*, *Libra*, corresponding with the month of *Cārtic*, the descending node will have gone back to *Aries*, and that consequently a *Lunar* eclipse may be expected to happen at the end of the *purnimā tithi*, or time of full moon, in that month.

## FIRST OPERATION.

To find the number of mean solar days, from the creation to some part of the *purnimā tithi* in *Cārtic* of the 4891st year of the *Cali Yug*.

Years expired of the <i>Cālā</i> to the end of the <i>Satya Yuga</i> ,	1970784000
Deduct the term of BRAHMA'S employment in the creation,	17064000
From the creation, when the planetary motions began, to the end of the <i>Satya Yuga</i> ,	1953720000
Add the <i>Trētā Yuga</i> ,	1296000
<i>Dwāpar Yuga</i> ,	864000
Present year of the <i>Cālī Yuga</i> ,	4890
From the creation to the next approaching <i>Bengal</i> year,	1955884890
Or Solar months, ( $\times 12$ )	23470618680
Add seven months,	72
	23470618680

As

As the solar months in a *Yug*, 51840000, are to the intercalary *lunar* months in that cycle 1593336, so are the solar months 23470618687, to their corresponding intercalary *lunar* months 721384677, which added together give 24192003364 lunations. This number multiplied by thirty produces 725760100920 *tis'his*, or lunar days, from the creation to the new moon in *Cártic*; to which add fourteen *tis'* for the same, to the *purnimā tis'his* in that month 725760100934. The as the number of *tis'his* in a *Yug*, 1603000080, is to their difference exceeding the mean solar days in that cycle (called *śhaya tis'his*) 2508225 so are 725760100934 *tis'his*, to their excess in number over the solar days 11356017987; which subtracted, leaves 714404082947, as the number mean solar days from the creation, or when the planetary motions began, a point of time which will be midnight under the first meridian of *Lanc* and near the time of full moon in *Cártic* \*. The first day after the creation being *Ravi-vár*, or *Sunday*, divide the number of days by seven for the day of the week, the remainder after the division being two, marks the day *Soma-vár*, or *Monday*.

#### SECOND OPERATION.

For the mean longitude of the sun, moon, and the ascending node Say, as the number of mean solar days in a *Mahā Yug* is to the revolution of any planet in that cycle, so are the days from the creation to even revolutions, which reject; and the fraction, if any, turned into signs, &c. is the mean longitude required.

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\* In the Year of the *Calī Yug* 4891 corresponding with 1196, *Bengal* style, and with the months of *October* or *November* (hereafter to be determined) in the year of *CHRIST* 1789.

1<sup>st</sup>. OF THE SUN.

$$\frac{714404082947 \times 4320000}{1577917828} = \overset{\text{Revolutions,}}{(1955884890)} \overset{\text{Signs,}}{6} \overset{^{\circ}}{22} \overset{' }{44} \overset{'' }{2} \overset{''' }{12}$$

2<sup>d</sup>. OF THE MOON.

$$\frac{714404082947 \times 57753336}{1577917828} = (26147888255) 0 \ 21 \ 21 \ 58 \ 56$$

3<sup>d</sup>. OF THE MOON'S APOGEE.

$$\frac{714404082947 \times 488203}{1577917828} = (221034460) \ 11 \ 5 \ 31 \ 13 \ 35$$

## CORRECTION OF THE BI'JA ADD.

$$\frac{714404082947 \times 4}{1577917828} = ( \dots ) \quad \begin{array}{r} 0 \ 37 \ 37 \ 52 \ 28 \\ 11 \ 7 \ 9 \ 6 \ 3 \end{array}$$

4<sup>th</sup>. OF THE MOON'S ASCENDING NODE.

$$\frac{714404082947 \times 232238}{1577917828} = (105147017) \ 4 \ 27 \ 49 \ 48 \text{ —}$$

## CORRECTION OF THE BI'JA ADD.

$$\frac{714404082947 \times 4}{1577917828} = ( \dots ) \quad \begin{array}{r} 0 \ 1 \ 37 \ 52 \ 28 \\ 4 \ 29 \ 27 \ 40 \ 28 \end{array}$$

5<sup>th</sup>. OF THE SUN'S APOGEE.

$$\frac{714404082947 \times 387}{1577917828} = (175 \dots) \ 2 \ 17 \ 17 \ 15 \text{ —}$$



	Mean longitude for midnight under the meridian of <i>Lancá</i> .	Deduct for the longi- tude of <i>Bhágáhpur</i> , as * 8° 50' of the Equa- tor east.	Mean longitude for midnight at <i>Bhágáhpur</i> .
Of the Sun,	6s 21° 44' 2" 12"	1' 27"	6 21 42 35 12
Moon,	— 21 21 58 56	19 34	— 21 2 25 —
Node,	4 29 27 40 28	— 4	4 29 27 36 —
Sun's Apogee,	2 17 17 15 —	inconfiderable	2 17 17 16 —
Moon's Apogee,	11 7 9 6 3	— 9	11 7 8 57 —

## THIRD OPERATION.

FOR the equated longitude of the Sun and Moon, &c.

## I. OF THE SUN.

THE mean longitude of the sun is 6s 21° 42' 35" 12"; of the apogee 2 17 17 15, the difference, or mean anomaly, 4s 4° 25' 20"; its complement to 6 fines, or distance from the perigee, 1s 25° 34' 40", the equation for which is required. This may either be taken from the foregoing table translated from *Macaranda*, or calculated in the manner explained as follows :

THE fine of 1s 25° 34' 40" is 2835' 31" and  $\frac{2835' 31" \times 20''}{3438} = 14' 30''$  to be subtracted from the *paridhi* degrees in *sama*; 14° — 14' 30" = 13° 53' 30", the circumference of the epicycle in this point of anomaly; and  $\frac{13° 43' 37'' \times 2825' 31''}{360''} = 108' 61''$  the fine of the angle of equation, considered as equal to its arc, or 1° 48' 6", to be deducted from the mean, for the

\* This longitude assigned to *Bhágáhpur* is erroneous; but the error does not in the least affect the main object of the Paper.

true longitude ;  $6s\ 21^{\circ}\ 42'\ 35'' - 1^{\circ}\ 48'\ 6'' = 6s\ 19^{\circ}\ 54'\ 29''$  for midnight agreeing with mean time ; but as, in this point of anomaly, the true or apparent midnight precedes that estimated for mean time, for which the computation has been made, a proportionable quantity must be deducted from the sun's place, which is thus found. Say, as the minutes contained in the ecliptic are to the sun's mean motion in one day  $59'\ 8''$ , so is the equation of his mean to his true place  $180'\ 6''$ , to the equation of time required,  $0'\ 18''$  ( $= \frac{59' 8'' \times 108' 6''}{21600}$ ) and  $6s\ 19^{\circ}\ 54'\ 29'' - 18' = 6s\ 19^{\circ}\ 54'\ 11''$  the sun's true longitude for the apparent midnight.

FOR the sun's true motion. The co-sine of the sun's distance from the perigee is  $1941' 0'' 1''$ , and  $\frac{1941' 0'' 1'' \times 13' 43' 30''}{3600} = 74'$  the co sine of the epicycle, and  $\frac{59' 8'' \times 74}{3438} = 1' 16''$  equation, to be added to the mean for the true motion,  $59' 8'' \times 1' 16'' = 65' 24''$  per day, or  $60'' 24''$  per *danda*.

## II. OF THE MOON

THE MOON's mean longitude for the mean midnight is  $0s\ 21^{\circ}\ 2'\ 25'$ , which exceeds her mean longitude for the true midnight, but  $\frac{108 \times 790 \times 135}{21600} = 3' 57''$  her motion in the difference of time between the mean and true midnight or  $21^{\circ}\ 2'\ 25' - 3' 57'' = 0\ 20' 58' 28''$  mean longitude, for which the anomalistic equation is to be found. Place of the apogee  $11s\ 7^{\circ}\ 8' 55''$ , and the moon's distance from it  $1s\ 13^{\circ}\ 49' 33''$ . The sine of the latter,  $2379' 39''$ . By the rule before explained  $\frac{2379' 39'' \times 20' 58' 28''}{3438} = 13' 51''$  and  $\frac{320 - 13' 51'' \times 2379' 39''}{360} = 210'$ , the sine of the angle of equation equal to its arc, or  $3^{\circ}\ 30'$ , to be subtracted,  $0^{\circ}\ 20' 58' 28'' - 3^{\circ}\ 30' = 0^{\circ}\ 17' 28' 28''$  the moon's true place, agreeing with the true or apparent midnight.

For the moon's true motion. The co-sine of her distance from the apogee 2479. 13. Circumference of the epicycle  $31^{\circ} 46' 9''$ , and  $\frac{31^{\circ} 46' 9'' \times 2479' 13''}{360^{\circ}} = 218' 47''$  co-sine in the epicycle. The moon's mean motion from her apogee is  $790' 35'' - 6' 41'' = 783' 54''$ , and  $\frac{783' 54'' \times 218' 47''}{3438'} = 49' 53''$  the equation of her mean to her true motion, to be subtracted,  $790. 35 - 49. 53 = 740. 42$  the moon's mean motion per day, or  $740'' 42'''$  per *danda*.

For the place of the moon's apogee reduced to the apparent midnight. The motion of the apogee is  $6' 41''$  per day.  $\frac{108' 6'' \times 6' 41''}{21600} = 2''$ , *is*  $7^{\circ} 8' 57'' - 2'' = 115 7^{\circ} 55''$  its place.

For the fame of the node. Its motion per day is  $3' 11''$  and  $\frac{108' 6'' \times 3' 11''}{21600} = 1''$ , and  $45 29^{\circ} 27' 36'' - 1'' = 45 29^{\circ} 27' 35''$  its place.

THE true longitude and motion, therefore, for the apparent time of midnight at *Bhāgalpur*, 714404082947 solar days after the creation, or commencement of the planetary motions, will be

	Longitude.				Motion per day.	
	'	°	'	''	''	'
Of the Sun,	6	19	54	11	60	24
Moon,	—	17	28	28	740	42
Sun's Apogee,	2	17	17	15	inconsiderable	
Moon's Apogee,	11	7	8	55	6	41
Moon's Node.	4	29	27	35	3	11

#### FOURTH OPERATION.

HAVING the longitude and motion as above, to determine the *tithi* and time remaining unexpired to the instant of opposition, or full moon.

THE

THE moon's longitude subtracted from the sun's, leaves  $5s\ 27^{\circ}\ 34'\ 17''$ , or  $10654'\ 17''$ ; which divided by  $720'$ , the minutes in a mean *tithi*, quotes fourteen even *tithis* expired; and the fraction, or remainder,  $574'\ 17''$ , is the portion expired of the 15th, or *purnimà tithi*; which, subtracted from  $720'$ , leaves  $145'\ 43''$  remaining unexpired of the same; which, divided by the moon's motion per *danda* from the sun, will give the time remaining unexpired from midnight to the instant of full moon with as much precision as the *Hindu* astronomy requires. Deduct the sun's motion,  $60''\ 24'''$  per *danda* from the moon's,  $740''\ 42'''$ , the remainder  $680''\ 8'''$ , is the moon's motion from the sun; by this divide the part remaining unexpired of the *purnimà tithi*,  $145'\ 43''$ .

$$\frac{145'\ 43'' = 524580''}{680''\ 8''' = 40818''} = \overset{\text{D. P.}}{12\ 51}$$

therefore 12 *dandas*, 51 *palas* after midnight, will be the end of the *purnimà tithi*, or instant of opposition of the sun and moon.

#### FIFTH OPERATION.

HAVING the instant of opposition as above, to find the true longitude and motion of the sun and moon, the latitude of the latter, and the place of the node.

ADD the mean motion of each for  $\overset{\text{D. P.}}{12\ 51}$  to the mean place, found before for the true midnight; and for the mean places so found, compute again the anomalistic equations. This being but a repetition of operation, the third is unnecessary to be detailed. These several particulars are as follow :

	Mean longitude for midnight.	Mean longitude at full moon.	Equation.	True longit. at full moon.
Of the Sun -	6s 21° 42' 17"	6s 21° 54' 17"	1° 47' 50"	6s 20° 7' 7"
Moon -	— 20 58 28	— 23 47 47	3 40 20	— 20 7 27
Moon's Apogee	11 7 8 55	11 7 10 21		
Moon's Node	4 29 27 35	4 29 28 16		

	Mean motion.	Equation.	True longit. at full moon.
Of the Sun	59' 8"	× 1' 16"	60' 24"
Moon	79° 35	— 47 28	743 7

HENCE it appears, that at the opposition the moon will be near her descending node; for  $4s\ 29^{\circ}\ 28'\ 16'' \times 6s = 10s\ 29^{\circ}\ 28'\ 16''$ , the place of the descending node in *antecedentia*, and  $12s - 10s\ 29^{\circ}\ 28'\ 16'' = 1s\ 0^{\circ}\ 31'\ 44''$  its longitude according to the order of the signs, and  $1s\ 0^{\circ}\ 31'\ 44'' - 20^{\circ}\ 7'\ 27'' = 10^{\circ}\ 24'\ 17''$ , the moon's distance from her descending node; which, being within the limit of a lunar eclipse, shows that the moon will be then eclipsed. For her latitude at this time, say, as radius is to the inclination of her orbit to the ecliptic  $4^{\circ}\ 30'$ , or  $270'$ , so is the sine of her distance from the node  $620'\ 57''$  to her latitude  $48'\ 45''$  ( $= \frac{279 \times 620' 57''}{3438}$ )

#### SIXTH OPERATION.

FROM the elements now found, to compute the diameters of the moon and shadow, and the duration of the eclipse.

	Yojan.
The Sun's mean diameter is	6500
Moon's - - -	480
Earth's - - -	1600

Sun's mean motion	59'	8"
Moon's -	790	35
Sun's true motion	60	24
Moon's -	743	7
Moon's latitude -	48	45

As the moon's mean motion is to her mean diameter, so is her true motion to her true diameter for the time of opposition  $\frac{743' 7'' \times 48''}{790 \times 35} = 451 11$  *Yōjan*; which, divided by fifteen, quotes 30' 5" of a great circle.

As the sun's mean motion is to his mean diameter, so is his true motion to his diameter at the instant of opposition  $\frac{60' 24'' \times 6560''}{59' 8''} = 6639 14$  *Yōjan*.

As the moon's mean motion is to the earth's diameter, so is the moon's equated motion to the *Sūchi*, or a fourth number, which must be taken as the earth's diameter, for the purpose of proportioning its shadow to the moon's distance and apparent diameter  $\frac{1600 \times 743' 7''}{790 \times 35} = 1503 56$  *Yōjam*, the *Sūchi*.

Equated diameter of the sun	6639 14
Of the earth - -	1503 56
Difference	<hr/> 5039 14

As the sun's mean diameter is to the moon's mean diameter, so is the difference above 5039 14, to a fourth number; which, deducted from the *Sūchi*, or equated diameter of the earth, leaves the diameter of the earth's shadow

shadow at the moon,  $\frac{48' \times 5' 19''}{6500} = 372.7$ , and  $1503.56 - 372.7 = 1131.49$  *Yojan*; which, divided by fifteen, quotes  $75' 27''$  of a great circle for the fame.

FROM the half fum of the diameters of the moon and shadow  $\frac{75' 27'' \times 30' 5''}{2} = 52' 46''$ , fubtract the moon's latitude  $48' 45''$ , the remainder is the *Cch'anna*, or portion of the moon's diameter eclipsed,  $4' 1''$  of a great circle; and by the nature of a right angled triangle, the fquare root of the difference of the fquares of the moon's latitude, and the half fum of the diameters of the fhadlow and moon, will be the path of the moon's centre, from the beginning to the middle of the eclipse.

The diameter of the fhadlow is	75	27
Of the moon	-	-
	-	30 5
Sum,	105	32
Half fum	52	46
The moon's latitude is	-	48 45

$\sqrt{52.46^2 \times 48.45^2} = 20' 11''$ ; which, divided by the moon's motion from the fun, quotes the half duration of the eclipse in *dandas* and *palas*, or *Hindu* mean folar hours,  $\frac{20' 11'' = 1211''}{682'' 43''} = 1$  46 25; which doubled, is 3 32 50, the whole duration of the eclipse; which will be partial, the moon's latitude being greater than the difference between the femidiameters of the moon's difc and the earth's fhadlow.

## SEVENTH OPERATION.

To find the position of the equinoctial colures, and thence the declination of the sun, the length of day and night, and the time counted from sun-rise, or hour of the civil day when the eclipse will happen.

1st. For the *ayanánfa*, or distance of the vernal equinox from the 1st of *Mesha*.  $\frac{7144 \times 4082947 \times 600}{1577917828} = (271650) 8s \ 4^{\circ} \ 31' \ 30'' \ 52'''$ , of which take the *bhija*  $8s \ 4^{\circ} \ 31' \ 30'' \ 52''' - 6s = 2s \ 4^{\circ} \ 31' \ 30'' \ 52'''$ , which multiply by three, and divide by ten,  $\frac{64^{\circ} \ 31' \ 30'' \ 52''' \times 3}{10} = 19^{\circ} \ 21' \ 27''$  the *ayanánfa*, which in the present age is added to the sun's longitude, to find his distance from the vernal equinox. The sun's equated longitude is  $6s \ 19^{\circ} \ 54' \ 11''$ , and  $6s \ 19^{\circ} \ 54' \ 11'' \times 19^{\circ} \ 21' \ 27'' = 7s \ 9^{\circ} \ 15' \ 38''$ , his distance from the vernal equinox.

2d. For the declination, right ascension, and ascensional difference. The sun's place is  $7s \ 9^{\circ} \ 15' \ 38''$ , and  $1s \ 9^{\circ} \ 15' \ 38''$  his distance from the autumnal equinox; the sine of which is  $2174' \ 41''$ ; and as radius is to the sine of the greatest declination  $24^{\circ}$ , termed the *paramápacramujyá*  $1397'$ , so is  $2174 \cdot 41$  to the sine of his declination  $883' \ 40''$ , the arc corresponding with which, in the canon of sines, is  $14^{\circ} \ 53'$  ( $\frac{1397 \times 2174' \ 41''}{3438} = 883' \ 40''$ ). The equinoctial shadow at *Bhágálpur* is  $5, 30$ ; and, as the *Gnomon* of twelve *angalas* is to the equinoctial shadow, so is the sine of the declination  $883 \cdot 40$ , to the *śhitijyá*,  $\frac{5 \ 30 \times 883' \ 40''}{3438} = 405' \ 1''$ . And as the co-sine of the declination is to radius, so is the *śhitijyá* to the sine of the *chara*, or ascensional difference  $\frac{405' \ 1'' \times 1438}{3322 \cdot 36} = 419' \ 4''$ , its arc is  $419' \ 56''$ , the ascensional difference.

3d. For the length of the day and night.



THE modern *Hindus* make their computations in mean solar time; the *Sūrya Siddhānta* directs, that they be made in sydercal time. A sydercal day contains sixty *dandas*; each *danda* sixty *viculas*, and each *vicula* fix respirations; in all 21600 respirations, answering to the minutes of the equator. A *nacshatra* day is exceeded in length by the *śavan* or solar day, by reason of the sun's proper motion in the ecliptic; the former measures time equably, but the latter varies in its length, from the inequality of the sun's motion and the obliquity of the ecliptic. The sun's equated motion for the middle of the eclipse was found 60' 24"; and the oblique ascension for the eighth sign from the vernal equinox, in which he will be found at that time, is taken from the foregoing table 343 *palas*, or 2058 respirations. As the number of minutes contained in one sign 1800, is to the number of respirations, or the arc of the equator in minutes answering to the oblique ascension of the sign the sun is in 2058, as above, so is the equated motion 60' 24", to the excess in respirations of the *śavan*, or solar day, over the *nacshatra*, or sydercal day,  $\frac{2058 \times 60' 24''}{1800} = 69' 3''$ ; which, added to 21600', gives the length of the solar day by civil account from sun-rise to sun-rise, sydercal time 21669. 3 respirations. From one-fourth of this deduct the ascensional difference, the sun being declined towards the south pole, for the semidiurnal arc; and add it for the seminocturnal arc. The former is 4997' 19", and the latter 5837' 11"; which may be reduced to *dandas*, or *Hindu* hours, by a division of 360. Hence half the day is  $\overset{D}{13} \overset{P}{52} \overset{V}{53}$ , and half the night  $\overset{D}{16} \overset{P}{12} \overset{V}{52}$ . The whole day added to half the night, shows the hour counted from the preceding sun-rise to midnight  $\overset{D}{43} \overset{P}{58} \overset{V}{38}$ ; to which add the time at midnight unexpired of the *purnimā tithi*, for the hour of the civil day corresponding with the middle of the eclipse. The hour from midnight to the end of the *purnimā tithi* is already found  $\overset{D}{12} \overset{P}{51}$  in mean solar time; and

to reduce it to sydereal time, say, as  $21600'$  is to  $21600'' \times 59' 8''$ , so is  $12 \begin{smallmatrix} D & P & V \\ 51 & & \end{smallmatrix}$ , to sidereal hours  $12 \begin{smallmatrix} D & P \\ 53 & \end{smallmatrix}$ , equal to  $12 \begin{smallmatrix} D & P \\ 51 & \end{smallmatrix}$  solar hours.

		$\begin{smallmatrix} D & P & V \\ & & \end{smallmatrix}$
From the preceding sun-rise to midnight is	-	$\begin{smallmatrix} 43 & 59 & - \end{smallmatrix}$
At midnight will remain of the <i>purnimà tit'hi</i>	-	$\begin{smallmatrix} 12 & 53 & - \end{smallmatrix}$
Hour of the civil day at the middle of the eclipse,		$\begin{smallmatrix} 56 & 52 & - \end{smallmatrix}$
Deduct the half duration	- - - -	$\begin{smallmatrix} 1 & 46 & 25 \end{smallmatrix}$
Beginning of the eclipse,	- - -	$\begin{smallmatrix} 55 & 5 & 35 \end{smallmatrix}$
Add the whole duration,	- - -	$\begin{smallmatrix} 3 & 32 & 50 \end{smallmatrix}$
End of the eclipse,	- - -	$\begin{smallmatrix} 58 & 38 & 25 \end{smallmatrix}$

And the day and night containing together  $60 \begin{smallmatrix} D & P & V \\ 11 & 30 & \end{smallmatrix}$ , the eclipse should end  $1 \begin{smallmatrix} D & P & V \\ 33 & 5 & \end{smallmatrix}$  before sun-rise, according to this calculation.

THE first day after the creation, according to the *Hindus*, was *ravi-vár*, or *Sunday*: the number of days, for which the above calculation has been made, is 714404082947; which divided by seven, the number of days in a week are 12057726135 weeks and two days. the astronomical day therefore of *foma-vár*, or *Monday*, will end at midnight preceding the eclipse; but the *foma-vár* by civil computation will continue to the next ensuing sun-rise; and this *fom-vár*, by calculating the number of days elapsed from the instant the sun entered the sign *Tulâ*, to his advance of  $19^\circ 54'$  on that sign, will be found to fall on the 19th of the month of *Cârtic*, answering to the 3d of November.

THE time of the full moon and the duration of the eclipse, found by

N n 2

this

this computation, differ considerably from the Nautical Almanack. The *Siddhānta Rahasya* and *Grahaś'ghava*, comparatively modern treatises, are nearer the truth, yet far from correct. The *Hindus*, in determining these phenomena, are satisfied when within a few minutes of the true time.

*A Comparative Statement of this Eclipse, as predicted in the Nautical Almanack, with Computations of it made by different Hindu Books.*

Those marked \*, are made for different meridians, the last, I believe, for *Tahit*.

NAMES.	Equated longitude for midnight at <i>Bhágálpur</i> , supposed in 8° 50' E. from <i>Lancá</i> , and 88° E. from <i>Greenwich</i>								
	The Sun.			The Moon.			The Node		
	S	°	'	S	°	'	S	°	'
Súrya Siddhánta, - - -	6	19	54 11	—	17	28 28	1	—	31 44
Tables of Macaranda, - -	6	19	55 9	—	17	30 9	1	—	32 7
*Grahálághava, - - - -									
Siddhánta Rahasya, - - -	6	19	54 2	—	17	16 25	1	—	27 35
Add to each the <i>ayánásha</i> 19° 21' 27" for the longitude counted according to <i>European</i> Astronomers from the equinoctial colure.									
	S	°	'	S	°	'	S	°	'
Súrya Siddhánta, - - -	7	9	15 38	1	6	49 55	1	19	53 11
Tables of Macaranda, - -	7	9	16 36	1	6	51 36	1	19	53 54
*Grahálághava, - - - -									
Siddhánta Rahasya, - - -	7	9	15 56	1	6	37 52	1	19	49 2
Nautical Almanack, - - -	7	10	47 8	1	7	50 28	1	19	45 30
	From midnight to the middle of the Eclipse.				Duration of the Eclipse.				
	Hindu time		English time		Hindu time		English time		
	D.	P.	V.	H.	M.	S.	D.	P.	V.
	12	53	—	5	9	12	3	12	50
Súrya Siddhánta, - - -									
Tables of Macaranda, - -									
*Grahálághava, - - - -	*14	50	—	5	56	—	5	18	—
Siddhánta Rahasya, - -	13	53	—	5	33	—	4	58	—
*Grahana Malá, a Catalogue of Eclipses, - - - -	16	6	—	6	26	24	5	26	—
Nautical Almanack, - -	16	37		6	24	15	5	22	24



## XVI.

### ON THE ANTIQUITY OF THE INDIAN ZODIAC.

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BY THE PRESIDENT.

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I ENGAGE to support an opinion (which the learned and industrious M. MONTUCLA seems to treat with extreme contempt) that the *Indian* division of the Zodiac was not borrowed from the *Greeks* or *Arabs*, but, having been known in this country from time immemorial, and being the same in part with that used by other nations of the old *Hindu* race, was probably invented by the first progenitors of that race before their dispersion. “The *Indians*,” he says, “have two divisions of the Zodiac; one, like that of the *Arabs*, relating to the moon, and consisting of *twenty-seven* equal parts, by which they can tell very nearly the hour of the night; another relating to the sun, and, like ours, containing twelve signs; to which they have given as many names, corresponding with those which we have borrowed from the *Greeks*.” All that is true; but he adds, “It is highly probable that they received them at some time or another by the intervention of the *Arabs*; for no man, surely, can persuade himself that it is the ancient division of the Zodiac, formed, according to some authors, by the forefathers of mankind, and still preserved among the *Hindus*.” Now I undertake to prove that the *Indian* Zodiac was not borrowed mediately or directly from the *Arabs* or *Greeks*; and, since the solar division of it in *India* is the same in substance with that used in *Greece*, we may reasonably conclude that both *Greeks* and *Hindus* received it from an older nation,

nation, who first gave names to the luminaries of heaven, and from whom both *Greeks* and *Hindus*, as their similarity in language and religion fully evinces, had a common descent.

THE same writer afterwards intimates, that “ the time when *Indian* Astronomy received its most considerable improvement” (from which it has now, as he imagines, wholly declined) “ was either the age when the *Arabs*, who established themselves in *Persia* and *Sogdiana*, had a great intercourse with the *Hindus*; or that, when the successors of CHENGIZ united both *Arabs* and *Hindus* under one vast dominion.” It is not the object of this essay to correct the historical errors in the passage last cited, nor to defend the astronomers of *India* from the charge of gross ignorance in regard to the figure of the earth and the distances of the heavenly bodies: a charge which MONTUCLA very boldly makes on the authority, I believe, of Father SOUCIET: I will only remark, that in our conversations with the *Pandits* we must never confound the system of the *Jyautishicas*, or mathematical astronomers, with that of the *Pauranicas*, or poetical fabulists; for to such a confusion alone must we impute the many mistakes of *Europeans* on the subject of *Indian* science. A venerable mathematician of this province, named RA'MACHANDRA, now in his eightieth year, visited me lately at *Crishnanagar*; and part of his discourse was so applicable to the inquiries which I was then making, that, as soon as he left me, I committed it to writing. “ The *Pauranics*,” he said, “ will tell you, that our earth is a plane figure studded with eight mountains, and surrounded by seven seas of milk, nectar, and other fluids; that the part which we inhabit is one of seven islands, to which eleven smaller isles are subordinate; that a God, riding on a huge *elephant*, guards each of the eight regions; and  
“ that

“ that a mountain of gold rises and gleams in the centre ; but we believe the  
 “ earth to be shaped like a *Cadamba*-fruit, or spheroidal, and admit only  
 “ four oceans of salt water; all which we name from the four cardinal points,  
 “ and in which are many great peninsulas, with innumerable islands. They  
 “ will tell you that a dragon’s head swallows the moon, and thus causes  
 “ an eclipse; but we know that the supposed head and tail of the dragon  
 “ mean only the nodes, or points formed by intersections of the ecliptic  
 “ and the moon’s orbit. In short, they have imagined a system, which exists  
 “ only in their fancy; but we consider nothing as true, without such evi-  
 “ dence as cannot be questioned.” I could not perfectly understand the  
 old Gymnosophist, when he told me that the *Rasichakra*, or *Circle of Signs*  
 (for so he called the zodiac) was like a *Dhustura* flower; meaning the  
*Datura*, to which the *Sanscrit* name has been softened, and the flower of  
 which is conical, or shaped like a funnel. At first I thought that he alluded  
 to a projection of the hemisphere on the plane of the colure, and to the  
 angle formed by the ecliptic and equator; but a younger astronomer,  
 named VINA’YACA, who came afterwards to see me, assured me that they  
 meant only the circular mouth of the tunnel, or the base of the cone; and  
 that it was usual among their ancient writers to borrow from fruits and flow-  
 ers their appellations of several plane and solid figures.

FROM the two *Brâhmanas*, whom I have just named, I learned the fol-  
 lowing curious particulars; and you may depend on my accuracy in re-  
 peating them, since I wrote them in their presence, and corrected what I  
 had written, till they pronounced it perfect. They divide a great circle, as  
 we do, into three hundred and sixty degrees, called by them *angus*, or *portions*;  
 of which they, like us, allot thirty to each of the twelve signs in this order:



<i>Mísha</i> , the Ram.	<i>Tulà</i> , the Balance.
<i>I'rishta</i> , the Bull.	8. <i>Vriśhchica</i> , the Scorpion.
<i>Mi'huna</i> , the Pair.	<i>Dhanus</i> , the Bow.
4. <i>Carca'a</i> , the Crab.	<i>Macara</i> , the Sea-Monster.
<i>Sinha</i> , the Lion.	<i>Cumbha</i> , the Ewer.
<i>Canyà</i> , the Virgin.	12. <i>Mina</i> , the Fish.

THE figures of the twelve afterisms, thus denominated with respect to the sun, are specified, by SRÍ'PÉTI, author of the *Retnamálà*, in *Sanskrit* verses; which I produce, as my vouchers, in the original, with a verbal translation :

Méshádayó náma samánarúpi,  
 Vinágadádhyam mit'hunam nriyugmam,  
 Pradipasafyé dadhati carábhyám  
 Návi st'hita várin'í canyacaiva.  
 Tulá tulábhrít pretimánapánir  
 Dhanur dhanushmán hayawat parángaḥ,  
 Mrigánanah syán macaró't'ha cumbhaḥ  
 Scandhé neró rictaghátam dadhánah,  
 Anyanyapuchch'hábhimuc'hó hi mínah  
 Matfyadwayam fwaft'halachárinómì.

“ THE *ram*, *bull*, *crab*, *lion*, and *scorpion*, have the figures of those five  
 “ animals respectively: the *pair* are a damsel playing on a *Vinà*, and a  
 “ youth wielding a mace: the *virgin* stands on a boat in water, holding  
 “ in one hand a lamp, in the other an ear of rice-corn: the *balance* is  
 “ held by a weigher with a weight in one hand: the *bow*, by an archer,  
 “ whose



# AR MANSTIONS.

हमिद



उमरुह



हमिद



हमिद



हमिद



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आमिद



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उमरुह



उमरुह



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आमिद





or not required by them, they fixed on the number twenty-seven, and inserted *Abhijit* for some astrological purpose in their nuptial ceremonies. The drawing, from which the plate was engraved, seems intended to represent the figures of the twenty-seven constellations, together with *Abhijit*, as they are described in three stanzas by the author of the *Retnamálá* :

1. Turagamuc'hafadrictham yónirúpam cshurábham,  
Saca'tafamam a'hain'afyóttamángéna tulyam,  
Man'ígrihas'ara chacrábháni s'álópamam bham,  
Sayanafadris'amanyachchátra paryancarúpam.
2. Haftácárayutam cha mauçticafamam  
chányat praválopamam,  
Dhrishyam tórana sannibham balinibham,  
fatcund'alábham param ;  
Crudhyatcéfarivicraména fadris'am,  
s'ayyáfamánam param,  
Anyad dentiviláavat st'hitamatah  
s'ringát'acavyaçti bham.
3. Trivicramábham cha mridangarúpam,  
Vrittam tatónyadyamalábhwayábham,  
Paryancarúpam murajánucáram,  
It'yévam as'wáðibhachacrarúpam.

“ A HORSE's head ; *yóni*, or *bhaga* ; a razor ; a wheeled carriage ; the  
“ head of an antelope ; a gem ; a house ; an arrow ; a wheel ; another  
“ house ; a bedstead ; another bedstead ; a hand ; a pearl ; a piece of  
“ coral ; a festoon of leaves ; an oblation to the Gods ; a rich ear-ring ;  
“ the tail of a fierce lion ; a couch ; the tooth of a wanton elephant,  
“ near

“ near which is the kernel of the *sringātaca*-nut; the three footsteps of  
 “ *Viṣṇu*; a tabor; a circular jewel; a two-faced imag; another couch;  
 “ and a smaller sort of tabor: such are the figures of *Aṣvini*, and the rest in  
 “ the circle of lunar constellations.”

THE *Hindu* draughtsman has very ill represented most of the figures; and he has transposed the two *Aśvāras* as well as the two *Bhadrāpads*; but his figure of *Abhijit*, which looks like our Ace of Hearts, has a resemblance to the kernel of the *trapa*, a curious water-plant described in a separate essay. In another *Sanśkrit* book the figures of the same constellations are thus varied:

A horse's head.	A straight tail.	A couch.
<i>Yōni</i> or <i>bhaga</i> .	Two stars S. to N.	A winnowing fan.
A flame.	Two, N. to S.	Another.
A waggon.	A hand.	An arrow.
A cat's paw.	A pearl.	A tabor.
One bright star.	Red saffron.	A circle of stars.
A bow.	A festoon.	A staff for burdens.
A child's pencil.	A snake.	The beam of a balance.
9. A dog's tail.	18. A boar's head.	27. A fish.

FROM twelve of the asterisms just enumerated are derived the names of the twelve *Indian* months in the usual form of patronymics; for the *Paurānics*, who reduce all nature to a system of emblematical mythology, suppose a celestial nymph to preside over each of the constellations, and feign that the God So'MA, or *Lunus*, having wedded twelve of them, became the father of twelve *Genii*, or Months, who are named  
 after

after their several mothers; but the *Jyautishicas* assert, that when the lunar year was arranged by former astronomers, the moon was at the full in each month on the very day when it entered the *nacshatra*, from which the month is denominated. The manner in which the derivatives are formed will best appear by a comparison of the months with their several constellations :

A'swina,	Chaitra.
Cártica.	8. Vaishá'ha.
Márgas'irsha.	Jyaisht't'ha.
4. Pausha.	A'rhá. ok <i>Arsha</i>
Mágha.	Srávana.
P'hálguna.	12. Bhádra.

THE third month is also called *A'graháyana* (whence the common word *Agran* is corrupted) from another name of *Mrigas'iras*.

NOTHING can be more ingenious than the memorial verses in which the *Hindus* have a custom of linking together a number\* of ideas otherwise unconnected, and of chaining, as it were, the memory by a regular measure : thus, by putting *teeth* for thirty-two, *Rudra* for eleven, *season* for six, *arrow* or *element* for five,—*ocean*, *Véda*, or *age*, for four,—*RA'MA* fire, or *quality* for three,—*eye*, or *CUMA'RA* for two—and *earth* or *moon* for one, they have composed four lines, which express the number of stars in each of the twenty-seven asterisms :

Vahni tri ritwíthu gunéndu critágnibhúta,  
Bánás'winétra s'ara bhúcu yugábdhi ráma'h,

Rudráb

Rudrábdhírámagunavédaśatá dwiyugma,  
 entá budhairabhíhitáh cramaśó bhatáráh.

THAT is, "Three, three, six; five, three, one; four, three, five;  
 " five, two, two; five, one, one; four, four, three; eleven, four, and  
 " three; three, four, a hundred; two, two, thirty-two: thus have the stars  
 " of the lunar constellations, in order as they appear, been numbered by  
 " the wife."

If the stanza was correctly repeated to me, the *two Aśhárás* are considered as one asterism, and *Abhijit* as three separate stars; but I suspect an error in the third line, because *dwibána*, or *two and five*, would suit the metre as well as *bdhíráma*; and because there were only three *Védas* in the early age, when it is probable the stars were enumerated, and the technical verse composed.

Two lunar stations (or *mansions*) and a quarter are co-extensive, we see, with one sign; and nine stations correspond with four signs: by counting, therefore, thirteen degrees and twenty minutes from the first star in the head of the Ram, inclusively, we find the whole extent of *Aświni*, and shall be able to ascertain the other stars with sufficient accuracy; but first let us exhibit a comparative table of both *Zodiacs*, denoting the mansions, as in the *Váránes* almanack, by the first letters or syllables of their names:



MONTHS.	SOLAR ASTERISMS.	MANSIONS.
A'fwin	Méfh	$\left\{ \begin{array}{l} A + bh + \frac{c}{4} \\ \frac{3c}{4} + r\bar{o} + \frac{M}{2} \\ \frac{M}{2} + \acute{a} + \frac{3p}{4} \\ \frac{p}{4} + p + s'l. \end{array} \right. 9.$
Cártic	Vriřh	
A'graháyan	Mit'hun	
Paufh	Carca't 4.	
Mágh	Sinh	$\left\{ \begin{array}{l} m + PU + \frac{v}{4} \\ \frac{3U}{4} + h + \frac{ch}{2} \\ \frac{ch}{2} + s + \frac{3v}{4} \\ \frac{v}{4} + a + j \end{array} \right. 18.$
P'hálgun	Canyà	
Chaitr	Tulà	
Vaiřác'h	Vriřchic 8.	
Jaiřt'h	Dhan	$\left\{ \begin{array}{l} mú + p\bar{u} + \frac{v}{4} \\ \frac{3u}{4} + S + \frac{db}{2} \\ \frac{dh}{2} + s' + \frac{3p'}{4} \\ \frac{p\acute{u}}{4} + u + r. \end{array} \right. 27\frac{1}{2}$
A'fhár	Macar	
Srávan	Cumbh	
Bhádr	Mín 12.	

HENCE we may readily know the stars in each mansion, as they follow in order :

LUNAR MANSIONS.	SOLAR ASTERISMS.	STARS.
Afwiní.	Ram	<i>Three</i> in and near the head
Bharaní.	—	<i>Three</i> in the tail.
Criticà.	Bull.	<i>Six</i> of the Pleiads.
Róhiní.	—	<i>Five</i> in the head and neck
Mrigafiras.	Pair.	$\left\{ \begin{array}{l} \textit{Three} \text{ in or near the feet} \\ \text{perhaps in the Galaxy.} \end{array} \right.$
A'ndrà.	—	<i>One</i> on the knee.

LUNA

LUNAR MANSIONS.	SOLAR ASTERISMS.	STARS
Punarvafu.	—	<i>Four</i> in the heads, breast and shoulder.
Pufhya.	Crab	<i>Three</i> , in the body and claws.
Afléfhà.	Lion.	<i>Five</i> , in the face and mane.
Maghà.	—	<i>Five</i> , in the leg and haunch.
Púrvap'halgunì.	—	<i>Two</i> , one in the tail.
Uttarap'halgunì.	Virgin	<i>Two</i> , on the arm and zone
Hafta.	—	<i>Five</i> , near the hand.
Chitrà.	—	<i>One</i> , in the fpike.
Swàti.	Balance	<i>One</i> , in the N. Scale.
Vis'ac'hà.	—	<i>Four</i> , beyond it.
Anurádhà.	Scorpion	<i>Four</i> , in the body.
Jyéfh't'hà.	—	<i>Three</i> , in the tail.
Múla.	Bow	<i>Eleven</i> , to the point of the arrow.
Púrvafhára.	—	<i>Two</i> , in the leg.
Uttaráfhára.	Sea-monfter.	<i>Two</i> , in the horn.
Sravanà.	—	<i>Three</i> , in the tail.
Dhanifht'à.	Ewer	<i>Four</i> , in the arm.
Satabhifhà.	—	<i>Many</i> , in the fteam.
Púrvabhadrapadà.	Fifh	<i>Two</i> , in the firft fifh.
Uttarabhadrapadà	—	<i>Two</i> , in the cord.
Révati.	—	<i>Thirty-two</i> , in the fecond fifh and cord.

WHEREVER the *Indian* drawing differs from the memorial verfe in the  
 VOL. II. P p *Retnámálà*.

*Retnamâlâ*, I have preferred the authority of the writer to that of the painter, who has drawn some terrestrial things with so little similitude, that we must not implicitly rely on his representation of objects merely celestial : he seems particularly to have erred in the stars of *Dhanishî'â*.

FOR the assistance of those who may be inclined to re-examine the twenty-seven constellations with a chart before them, I subjoin a table of the degrees, to which the *nachtrats* extend respectively from the first star in the asterism of *Aries*, which we now see near the beginning of the sign *Taurus*, as it was placed in the ancient sphere.

N.	D.	M.	N.	D.	M.	N.	D.	M.
I.	13°.	20'.	X.	133°.	20'.	XIX.	253°.	20'.
II.	26°.	40'.	XI.	146°.	40'.	XX.	266°.	40'.
III.	40°.	0'.	XII.	160°.	0'.	XXI.	280°.	0'.
IV.	53°.	20'.	XIII.	173°.	20'.	XXII.	293°.	20'.
V.	66°.	40'.	XIV.	186°.	40'.	XXIII.	306°.	40'.
VI.	80°.	0'.	XV.	200°.	0'.	XXIV.	320°.	0'.
VII.	93°.	20'.	XVI.	213°.	20'.	XXV.	333°.	20'.
VIII.	106°.	40'.	XVII.	226°.	40'.	XXVI.	346°.	40'.
IX.	120°.	0'.	XVIII.	240°.	0'.	XXVII.	360°.	0'.

THE asterisms of the *first* column are in the signs of *Taurus*, *Gemini*, *Cancer*, *Leo*; those of the *second*, in *Virgo*, *Libra*, *Scorpio*, *Sagittarius*; and those of the *third*, in *Capricornus*, *Aquarius*, *Pisces*, *Aries*. We cannot err much, therefore, in any series of *three* constellations; for, by counting 13° 20' forwards and backwards, we find the spaces occupied by the

two extremes; and the intermediate space belongs of course to the middlemost. It is not meant that the division of the *Hindu* Zodiac into such spaces is exact to a minute, or that every star of each asterism must necessarily be found in the space to which it belongs; but the computation will be accurate enough for our purpose, and no lunar mansion can be very remote from the path of the moon. How Father SOUCHEI could dream that *Vyāc'hā* was in the Northern Crown, I can hardly comprehend; but it surpasses all comprehension that M. BAILLY should copy his dream, and give reasons to support it; especially as four stars, arranged pretty much like those in the *Indian* figure, present them obviously near the Balance, or the Scorpion. I have not the boldness to exhibit the individual stars in each mansion, distinguished in BAYLER's method by *Greek* letters, because, though I have little doubt that the five stars of *Aśvīnā*, in the form of a wheel, are α, γ, ζ, μ, ι, of the Lion, and those of *Māda*, γ, ι, δ, ζ, φ, τ, σ, ι, ο, ξ, π, of the *Sagittary*, and though I think many of the others equally clear, yet, where the number of stars in a mansion is less than three, or even than four, it is not easy to fix on them with confidence, and I must wait until some young *Hindu* astronomer, with a good memory and good eyes, can attend my leisure on serene nights at the proper seasons, to point out in the firmament itself the several stars of all the constellations for which he can find names in the *Sanskrit* language. The only stars, except those in the *Zodiac*, that have yet been distinctly named to me, are the *Septarshi*, *Dhruva*, *Arundhatī*, *Vishnupad*, *Mutramandāl*, and, in the southern hemisphere, *Agastya*, or *Cavopus*. The twenty-seven *Yōga* stars, indeed, have particular names, in the order of the *nacshatras*,

to which they belong; and since we learn \* that the *Hindus* have determined the *latitude, longitude, and right ascension of each*, it might be useful to exhibit the list of them; but at present I can only subjoin the names of twenty-seven *Yógas*, or divisions of the ecliptic.

<i>Vishcamhá.</i>	<i>Ganda.</i>	<i>Parigha.</i>
<i>Priti.</i>	<i>Vridhhi.</i>	<i>Síva.</i>
<i>Ayushmat.</i>	<i>Dhruva.</i>	<i>Siddha.</i>
<i>Saubhágya.</i>	<i>Vyágháta.</i>	<i>Sádhyá.</i>
<i>Sóbhana.</i>	<i>Heršana.</i>	<i>Subhá.</i>
<i>Atiganda.</i>	<i>Vajra.</i>	<i>Sucra.</i>
<i>Sucarman.</i>	<i>Afríj.</i>	<i>Brahman.</i>
<i>Dhriti.</i>	<i>Vyatipáta.</i>	<i>Indra.</i>
<i>Súla.</i>	<i>Vuriyas.</i>	<i>Vaidhriti.</i>

HAVING shown in what manner the *Hindus* arrange the *Zodiacal* stars with respect to the sun and moon, let us proceed to our principal subject, *the antiquity of that double arrangement*. In the first place, the *Bráhmans* were always too proud to borrow their science from the *Greeks, Arabs, Moguls*, or any nation of *Mléchch'has*, as they call those who are ignorant of the *Védas*, and have not studied the language of the Gods. They have often repeated to me the fragment of an old verse, which they now use proverbially, *na níchò yavanátparah*, or *no base creature can be lower than a Yavan*; by which name they formerly meant an *Ionian* or *Greek*, and now mean a *Mogul*, or, generally, a *Muselman*. When I mentioned to different *Pandits*, at several times and in several places, the opinion of MONTUCLA, they could not prevail on themselves to oppose it by serious

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\* See p. 270.



# ORIENTAL ZODIAC.

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argument; but some laughed heartily; others, with a sarcastic smile, said it was a *pleasant imagination*; and all seemed to think it a notion bordering on phrenzy. In fact, although the figures of the twelve *Indian* signs bear a wonderful resemblance to those of the *Grecian*, yet they are too much varied for a mere copy, and the nature of the variation proves them to be original; nor is the resemblance more extraordinary than that, which has often been observed, between our *Gothic* days of the week and those of the *Hindus*, which are dedicated to the same luminaries, and (what is yet more singular) revolve in the same order: *Ruvi*, the Sun; *Sama*, the Moon; *Mangala*, *Tuisc*, *Budha*, Woden; *Vrihaspati*, Thor; *Sucra*, Freya; *Sani*, Sater; yet no man ever imagined that the *Indians* borrowed so remarkable an arrangement from the *Goths* or *Germans*. On the planets I will only observe, that *Sucra*, the regent of *Venus*, is, like all the rest, a male deity, named also *Uttamas*, and believed to be a sage of infinite learning; but *Sohran*, the *Nahid* of the *Persians*, is a goddess like the *Freya* of our *Saxon* progenitors: the drawing, therefore, of the planets, which was brought into *Bengal* by Mr. JOHNSON, relates to the *Persian* system; and represents the genii supposed to preside over them, exactly as they are described by the poet *Hafizi*: "He bedecked the firmament with stars, and ennobled this earth with the face of men: he gently turned the auspicious new moon of the festival, like a bright jewel, round the ankle of the sky; he placed the *Hindu* SATURN on the seat of that revolve elephant, the revolving sphere, and put the rainbow into his hand, as a hook to coerce the intoxicated beast; he made silken strings of sunbeams for the lute of *Vants*; and presented *Jurhan*, who saw the felicity of true religion, with a rosary of clustering *Alhads*. The bow of the sky became that of *Mars*, when he was honoured with the command of the celestial host; for God conferred sovereignty on the Sun, and squadrons of stars were his army."



THE names and forms of the lunar constellations, especially of *Bharani* and *Abhijit*, indicate a simplicity of manners peculiar to an ancient people; and they differ entirely from those of the *Arabian* system, in which the very first asterism appears in the dual number, because it consists only of two stars. *Menzil*, or the place of alighting, properly signifies a station or stage, and thence is used for an ordinary day's journey; and that idea seems better applied than *mansion* to so incessant a traveller as the moon. The *menázili'l kamar*, or lunar stages of the *Arabs*, have twenty-eight names, in the following order, the particle *al* being understood before every word:

Sharatân.	Nathrah.	Ghafr.	Dhábih'
Bu'tain	Tarf.	Zubáníyah.	Bulaâ.
Thurayyâ.	Jabhah.	Iclil.	Suûd.
Debarân.	Zubrah.	Kalb.	Akhbiya.
Hakûah.	Sarfah.	Shaulah.	Mukdim.
Hanâah.	Awwâ.	Naâm.	Múkhîr.
7. Dhirââ.	14. Simâc.	21. Beldah.	28. Rifhâ.

Now, if we can trust the *Arabian* lexicographers, the number of stars in their several *menzils* rarely agrees with those of the *Indians*; and two such nations must naturally have observed, and might naturally have named, the principal stars near which the moon passes in the course of each day, without any communication on the subject. There is no evidence indeed, of a communication between the *Hindus* and *Arabs* on any subject of literature or science; for, though we have reason to believe that a commercial intercourse subsisted in very early times between *Yemen* and the western coast of *India*, yet the *Bráhmans*, who alone are permitted to read the

the six *Védangas*, one of which is the astronomical *Sastra*, were not then commercial, and, most probably, neither could nor would have conversed with *Arabian* merchants. The hostile irruptions of the *Arabs* into *Hindustán*, in the eighth century, and that of the *Moguls* under CHENGÍ'Z, in the thirteenth, were not likely to change the astronomical system of the *Hindus*; but the supposed consequences of *modern* revolutions are out of the question; for, if any historical records be true, we know with as positive certainty, that AMARSINH and CA'LIDA's composed their works before the birth of CHRIST, as that MENANDER and TERENCE wrote before that important epoch. Now the twelve *signs* and twenty-seven *mansions* are mentioned by several names before exhibited, in a *Sanscrit* vocabulary by the first of those *Indian* authors; and the second of them frequently alludes to *Róbin*—and the rest by name in his *Fatal Ring*, his *Children of the Sun*, and his *Birth of CUMA'RA*; from which poem I produce two lines, that my evidences may not seem to be collected from mere conversation:

Maitrè muhúrtè sasalínch'hanéna,  
Yógam gratafúttarap'halganishu

“ When the stars of *Uttarap'halgun* had joined in a fortunate hour the  
“ fawn-spotted moon.”

THIS testimony being decisive against the conjecture of M. MONTUCLA, I need not urge the great antiquity of MENU's Institutes, in which the twenty-seven asterisms are called the daughters of DACSHA and the consorts of SOMA, or the Moon, nor rely on the testimony of the *Bráhmans*, who assure me with one voice, that the names of the *Zodiacal* stars occur in the *Védas*; three of which I firmly believe, from internal and external evidence,

evidence, to be more than *three thousand* years old. Having therefore proved what I engaged to prove, I will close my essay with a general observation. The result of NEWTON's researches into the history of the primitive sphere was, " That the practice of observing the stars began in *Egypt* in the days of AMMON, and was propagated thence by conquest in the reign of his son SISAC, into *Africk, Europe, and Asia*; since which time ATLAS formed the sphere of the *Lybians*; CHIRON, that of the *Greeks*; and the *Chaldeans*, a sphere of their own." Now I hope, on some other occasions, to satisfy the public, as I have perfectly satisfied myself, that the practice of observing the stars began, with the rudiments of civil society, in the country of those whom we call *Chaldeans*; from which it was propagated into *Egypt, India, Greece, Italy, and Scandinavia*, before the reign of SISAC or SA'CYA, who by conquest spread a new system of religion and philosophy from the *Nile* to the *Ganges* about a thousand years before CHRIST; but that CHIRON and ATLAS were allegorical or mythological personages, and ought to have no place in the serious history of our species."

## XVII.

### AN ACCOUNT OF THE KINGDOM OF NEPAL,

BY FATHER GIUSEPPE,

PREFECT OF THE ROMAN MISSION.

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COMMUNICATED BY JOHN SHORE, ESQ.

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THE kingdom of *Népál* is situated to the north-east of *Patna*, at the distance of ten or eleven days journey from that city. The common road to it lies through the kingdom of *Macwanpur*; but the missionaries and many other persons enter it on the *Bettia* quarter. Within the distance of four days journey from *Népál* the road is good in the plains of *Hindustán*, but in the mountains it is bad, narrow, and dangerous. At the foot of the hills the country is called *Teriání*; and there the air is very unwholesome from the middle of *March* to the middle of *November*, and people in their passage catch a disorder called in the language of that country *Anl*, which is a putrid fever, and of which the generality of people who are attacked with it die in a few days; but on the plains there is no apprehension of it. Although the road be very narrow and inconvenient for three or four days at the passes of the hills, where it is necessary to cross and recross the river more than fifty times, yet, on reaching the interior mountain before you descend, you have an agreeable prospect of the extensive plain of *Népál*, resembling an amphitheatre covered with populous towns and villages: the circumference of the plain is about 200 miles, a little irregular, and surrounded by hills on all sides, so that no person can enter or come out of it without passing the mountains.

THERE are three principal cities in the plain, each of which was the capital of an independent kingdom; the principal city of the three is situated to the northward of the plain, and is called *Cat'hmandú*: it contains about 18,000 houses; and this kingdom from south to north extends to the distance of twelve or thirteen days journey as far as the borders of *Thibet*, and is almost as extensive from east to west. The king of *Cat'hmandú* has always about 50,000 soldiers in his service. The second city to the south-west of *Cat'hmandú* is called *Lelit Pattan*, where I resided about four years; it contains near 24,000 houses: the southern boundary of this kingdom is at the distance of four days journey, bordering on the kingdom of *Macwanpur*. The third principal city to the east of *Lelit Pattan* is called *B'hátgáu*; it contains about 12,000 families, extends towards the east to the distance of five or six days journey, and borders upon another nation, also independent, called *Cirátas*, who profess no religion. Besides these three principal cities, there are many other large and less considerable towns or fortresses, one of which is *Tini*, and another *Cipoli*, each of which contains about 8,000 houses, and is very populous: all those towns, both great and small, are well built; the houses are constructed of brick, and are three or four stories high; their apartments are not lofty; they have doors and windows of wood well worked, and arranged with great regularity. The streets of all their towns are paved with brick or stone, with a regular declivity to carry off the water. In almost every street of the capital towns there are also good wells made of stone, from which the water passes through several stone-canals for the public benefit. In every town there are large square varandas well built, for the accommodation of travellers and the public; these varandas are called *Pali*; and there are also many of them, as well as wells, in different parts of the country for public use. There are also,

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on the outside of the great towns, small square reservoirs of water faced with brick, with a good road to walk upon, and a large flight of steps for the convenience of those who choose to bathe. A piece of water of this kind on the outside of the city of *Caśhmándú* was at least 200 feet long on each side of the square, and every part of its workmanship had a good appearance.

THE religion of *Nepál* is of two kinds; the more ancient is professed by many people who call themselves *Baryefu*: they pluck out all the hair from their heads; their dress is of coarse red woollen cloth, and they wear a cap of the same: they are considered as people of the religious order; and their religion prohibits them from marrying, as it is with the *Lamas* of *Thibet*, from which country their religion was originally brought; but in *Nepál* they do not observe this rule, except at their discretion: they have large monasteries, in which every one has a separate apartment or place of abode; they observe also particular festivals, the principal of which is called *Yátrá* in their language, and continues a month or longer, according to the pleasure of the king. The ceremony consists in drawing an idol (which at *Lelit Pattan* is called *BAGHERO* \*) in a large and richly ornamented car, covered with gilt copper. Round about the idol stand the king and the principal *Baryefus*; and in this manner the vehicle is almost every day drawn through some one of the streets of the city by the inhabitants, who run about beating and playing upon every kind of instrument their country affords, which make an inconceivable noise.

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\* I suppose a name of *Bhagavat* or *Criřna*; but *Bhága* is *Mahadéva*, and *Bary* or *Var* means the *Thunderer*.

THE other religion, the more common of the two, is that of the *Bráhmens*, and is the same as is followed in *Hindustan*, with the difference that in the latter country the *Hindus* being mixed with the *Mohammedans*, their religion also abounds with many prejudices, and is not strictly observed; whereas in *Népál*, where there are no *Myselmans* (except one *Cashmirian* merchant) the *Hindu* religion is practised in its greatest purity. Every day of the month they class under its proper name, when certain sacrifices are to be performed, and certain prayers offered up in their temples. The places of worship are more in number in their towns than I believe, are to be found in the most populous and most flourishing cities of *Christendom*; many of them are magnificent, according to their idea of architecture, and constructed at a very considerable expence; some of them have four or five square cupolas; and in some of the temples two or three of the extreme cupolas, as well as the doors and windows of them, are decorated with gilt copper.

IN the city of *Lelit Pattan* the temple of BAGHERO was contiguous to my habitation, and was more valuable, on account of the gold, silver, and jewels it contained, than even the house of the king. Besides the large temples, there are also many small ones, which have stairs, by which a single person may ascend on the outside all around them; and some of those small temples have four sides, others six, with small stone or marble pillars polished very smooth, with two or three pyramidal stories, and all the ornaments well gilt and neatly worked, according to their ideas of taste: and I think, that, if *Europeans* should ever go into *Népál* they might take some models from those little temples, especially from the two which are in the great court of *Lelit Pattan* before the royal palace. On the outside of some of their temples there are also gre.

square pillars of single stones, from twenty to thirty feet high, upon which they place their idols, superbly gilt. The greatest number of their temples have a good stone staircase in the middle of the four squares, and at the end of each flight of stairs, there are lines cut out of stone on both sides. Round about their temples there are also bells, which the people ring on particular occasions; and when they are at prayers, many cupolas are also quite filled with little bells hanging by cords in the inside, about the distance of a foot from each other, which make a great noise on that quarter where the wind conveys the sounds. There are not only superb temples in their great cities, but also within their castles.

To the eastward of *Cat'mándú*, at the distance of about two or three miles, there is a place called *Tolu*, by which there flows a small river, the water of which is esteemed holy, according to their superstitious ideas; and thither they carry people of high rank, when they are thought to be at the point of death. At this place there is a temple, which is not inferior to the best and richest in any of the capital cities. They also have it on tradition, that, at two or three places in *Népál*, valuable treasures are concealed under ground: one of those places they believe is *Tolu*, but no one is permitted to make use of them except the king, and that only in cases of necessity. Those treasures, they say, have been accumulated in this manner: When any temple had become very rich from the offerings of the people, it was destroyed, and deep vaults dug under ground, one above another, in which the gold, silver, gilt copper, jewels, and every thing of value were deposited. When I was in *Népál*, GAINPREJAS, king of *Cat'mándú*, being in the utmost distress for money to pay his troops, in order to support himself against PRITHWÍ'NÁ'RÁ'YAN, ordered search to be made for the treasures of *Tolu*; and, having dug to a considerable depth under ground, they came



to the first vault, from which his people took the value of a lac of rupees in gilt copper, with which GAINPREJAS paid his troops, exclusive of a number of small figures in gold or gilt copper, which the people who had made the search had privately carried off: and this I know very well; because one evening as I was walking in the country alone, a poor man whom I met on the road, made me an offer of a figure of an idol in gold or copper gilt, which might be five or six sicca weight, and which he cautiously preserved under his arm; but I declined accepting it. The people of GAINPREJAS had not completely emptied the first vault when the army of PRIT'HWI'VA'RA'YAN arrived at *Tolu*, possessed themselves of the place where the treasure was deposited, and closed the door of the vault, having first replaced all the copper there had been on the outside.

To the westward also of the great city of *Lelit Pattan*, at the distance of only three miles, is a castle called *Banga*, in which there is a magnificent temple. No one of the missionaries ever entered into this castle, because the people who have the care of it, have such a scrupulous veneration for this temple, that no person is permitted to enter it with his shoes on; and the missionaries, unwilling to shew such respect to their false deities, never entered it. But when I was at *Népál*, this castle being in the possession of the people of *Góre'há*, the commandant of the castle and of the two forts which border on the road, being a friend of the missionaries, gave me an invitation to his house, as he had occasion for a little physic for himself and some of his people: I then, under the protection of the commandant, entered the castle several times, and the people durst not oblige me to take off my shoes. One day, when I was at the commandant's house, he had occasion to go into the varanda, which is at the bottom of the great court facing the temple, where all the chiefs dependent upon his orders

orders were assembled, and where also was collected the wealth of the temple; and, wishing to speak to me before I went away, he called me into the varanda. From this incident I obtained a sight of the temple, and then passed by the great court which was in front: it is entirely marble, almost blue, but interspersed with large flowers of bronze well disposed to form the pavement of the great court-yard, the magnificence of which astonished me; and I do not believe there is another equal to it in *Europe*.

BESIDES the magnificence of the temples which their cities and towns contain, there are many other rarities. At *Cat'hmandú*, on one side of the royal garden, there is a large fountain, in which is one of their idols, called *Nárdyan*. This idol is of blue stone, crowned and sleeping on a mattress also of the same kind of stone; and the idol and the mattress appear as floating upon the water. This stone-machine is very large: I believe it to be eighteen or twenty feet long, and broad in proportion, but well worked, and in good repair.

IN a wall of the royal palace of *Cat'hmandú*, which is built upon the court before the palace, there is a great stone of a single piece, which is about fifteen feet long, and four or five feet thick; on the top of this great stone there are four square holes at equal distances from each other. In the inside of the wall they pour water into the holes; and in the court-side, each hole having a closed canal, every person may draw water to drink: at the foot of the stone is a large ladder, by which people ascend to drink; but the curiosity of the stone consists in its being quite covered with characters of different languages cut upon it. Some lines contain the characters of the language of the country; others the characters of

*Thibet*;



are always interred, and when the war was ended, I myself went to see the monuments upon the hills.

I BELIEVE that the kingdom of *Népál* is very ancient, because it has always preserved its peculiar language and independence; but the cause of its ruin is the dissention which subsists among the three kings. After the death of their sovereign, the nobles of *Lelit Pattan* nominated for their king GAINPREJAS, a man possessed of the greatest influence in *Népál*; but some years afterwards they removed him from his government, and conferred it upon the king of *Bhatgán*; but he also a short time afterwards was deposed; and, after having put to death another king who succeeded him, they made an offer of the government to PRIT'HWI'NA'RA'YAN, who had already commenced war. PRIT'HWI'NA'RA'YAN deputed one of his brothers, by name DELMERDEN SA'H, to govern the kingdom of *Lelit Pattan*, and he was in the actual government of it when I arrived at *Népál*; but the nobles perceiving that PRIT'HWI'NA'RA'YAN still continued to interrupt the tranquillity of the kingdom, they disclaimed all subjection to him, and acknowledged for their sovereign DELMERDEN SA'H, who continued the war against his brother PRIT'HWI'NA'RA'YAN: but some years afterwards, they even deposed DELMERDEN SA'H, and elected in his room a poor man of *Lelit Pattan*, who was of royal origin.

THE king of *Bhatgán*, in order to wage war with the other kings of *Népál* had demanded assistance from PRIT'HWI'NA'RA'YAN, but seeing that PRIT'HWI'NA'RA'YAN was possessing himself of the country, he was obliged to desist, and to take measures for the defence of his own possessions; so that the king of *Górc'há*, although he had been formerly a subject of GAINPREJAS, taking advantage of the dissentions which prevailed among the other kings of

*Népál*, attached to his party many of the mountain-chiefs, promising to keep them in possession, and also to augment their authority and importance; and, if any of them were guilty of a breach of faith, he seized their country as he had done to the kings of *Marecajis*, although his relations.

THE king of *Górc'hà* having already possessed himself of all the mountains which surround the plain of *Népál*, began to descend into the flat country, imagining he should be able to carry on his operations with the same facility and success as had attended him on the hills; and, having drawn up his army before a town, containing about 8000 houses, situate upon a hill called *Cirtipur*, about a league's distance from *Cat'hmandú*, employed his utmost endeavours to get possession of it. The inhabitants of *Cirtipur* receiving no support from the king of *Lelit Pattan*, to whom they were subject, applied for assistance to GAINPREJAS, who immediately marched with his whole army to their relief, gave battle to the army of the king of *Górc'hà*, and obtained a complete victory. A brother of the king of *Górc'hà* was killed on the field of battle; and the king himself, by the assistance of good bearers, narrowly escaped with his life by fleeing into the mountains. After the action, the inhabitants of *Cirtipur* demanded GAINPREJAS for their king, and the nobles of the town went to confer with him on the business; but, being all assembled in the same apartment with the king, they were all surprised and seized by his people. After the seizure of those persons, GAINPREJAS, perhaps to revenge himself of those nobles, for having refused their concurrence to his nomination as king, privately caused some of them to be put to death; another, by name DANUVANTA, was led through the city in a woman's dress, along with several others, clothed in a ridiculous and whimsical manner, at the expense of the nobles of *Lelit Pattan*.

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They were then kept in close confinement for a long time: at last, after making certain promises, and interesting all the principal men of the country in their behalf, GAINPREJAS set them at liberty.

THE king of *Gorc'hà*, despairing of his ability to get possession of the plain of *Népal* by strength, hoped to effect his purpose by causing a famine; and with this design stationed troops at all the passes of the mountains to prevent any intercourse with *Népal*; and his orders were most rigorously obeyed, for every person who was found in the road, with only a little salt or cotton about him, was hung upon a tree; and he caused all the inhabitants of a neighbouring village to be put to death in a most cruel manner: even the women and children did not escape, for having supplied a little cotton to the inhabitants of *Népal*; and, when I arrived in that country at the beginning of 1769, it was a most horrid spectacle to behold so many people hanging on trees in the road. However, the king of *Gorc'hà* being also disappointed in his expectations of gaining his end by this project, fomented dissensions among the nobles of the three kingdoms of *Népal*, and attached to his party many of the principal ones, by holding forth to them liberal and enticing promises; for which purpose he had about 2000 *Brahmens* in his service. When he thought he had acquired a party sufficiently strong, he advanced a second time with his army to *Cirtipur*, and laid siege to it on the north-west quarter, that he might avoid exposing his army between the two cities of *Cat'hmandú* and *Lelit Pattan*. After a siege of several months, the king of *Gorc'hà* demanded the regency of the town of *Cirtipur*; when the commandant of the town, seconded by the approbation of the inhabitants, dispatched to him by an arrow a very impertinent and exasperating answer. The king of *Gorc'hà* was so much enraged at this mode of proceeding, that he gave immediate orders to all his troops to storm

the town on every side: but the inhabitants bravely defended it, so that all the efforts of his men availed him nothing; and, when he saw that his army had failed of gaining the precipice, and that his brother, named SURU'PARATNA, had fallen wounded by an arrow, he was obliged to raise the siege a second time, and to retreat with his army from *Cirtipur*. The brother of the king was afterwards cured of his wound by our Father MICHAEL ANGELO, who is at present in *Bettia*.

AFTER the action the king of *Gorc'hà* sent his army against the king of *Lamji* (one of the twenty-four kings who reign to the westward of *Népál*) bordering upon his own kingdom of *Gorc'hà*. After many desperate engagements, an accommodation took place with the king of *Lamji*: and the king of *Gorc'hà* collecting all his forces, sent them for the third time to besiege *Cirtipur*; and the army on this expedition was commanded by his brother SURU'PARATNA. The inhabitants of *Cirtipur* defended themselves with their usual bravery; and after a siege of several months, the three kings of *Népál* assembled at *Cat'hmandú* to march a body of troops to the relief of *Cirtipur*. One day in the afternoon they attacked some of the *Tanas* of the *Gorc'hians*, but did not succeed in forcing them, because the king of *Gorc'hà*'s party had been reinforced by many of the nobility, who to ruin GAINPREJAS were willing to sacrifice their own lives. The inhabitants of *Cirtipur* having already sustained six or seven months siege, a noble of *Lelit Puttan* called DANUVANTA fled to the *Gorc'hà* party, and treacherously introduced their army into the town. The inhabitants might still have defended themselves, having many other fortresses in the upper parts of the town to retreat to; but the people at *Gorc'hà* having published a general amnesty, the inhabitants, greatly exhausted by the fatigue of a long siege, surrendered themselves prisoners upon the faith  
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of that promise. In the mean time the men of *Gorc'hā* seized all the gates and fortresses within the town; but two days afterwards PRIT'HWI'NA'RA'YAN, who was at *Navarāta* (a long day's journey distant) issued an order to SURU'PARATNA his brother, to put to death some of the principal inhabitants of the town, and to cut off the noses and lips of every one, even the infants, who were not found in the arms of their mothers; ordering at the same time all the noses and lips which had been cut off to be preserved, that he might ascertain how many souls there were, and to change the name of the town into *Naskatāpur*, which signifies the *town of cut-noses*. The order was carried into execution with every mark of horror and cruelty, none escaping but those who could play on wind instruments; although Father MICHAEL ANGELO, who, without knowing that such an inhuman scene was then exhibited, had gone to the house of SURU'PARATNA, and interceded much in favour of the poor inhabitants. Many of them put an end to their lives in despair; others came in great bodies to us in search of medicines; and it was most shocking to see so many living people with their teeth and noses resembling the skulls of the deceased.

AFTER the capture of *Cirtipur*, PRIT'HWI'NA'RA'YAN dispatched immediately his army to lay siege to the great city of *Lelit Pattan*. The *Gorc'hians* surrounded half the city to the westward with their *Tumas*; and, my house being situated near the gate of that quarter, I was obliged to retire to *Cut'māndū* to avoid being exposed to the fire of the besiegers. After many engagements between the inhabitants of the town of *Lelit Pattan* and the men of *Gorc'hā*, in which much blood was spilled on both sides, the former were disposed to surrender themselves, from the fear of having their noses cut off, like those at *Cirtipur*, and also their right hands: a barbarity the *Gorc'hians* had threatened them with, unless they would surrender within five days. One night all the *Gorc'hians* quitted the siege of *Lelit Pat-*



tan to pursue the *English* army, which, under the command of Captain KINLOCH, had already taken *Sidáli*, an important fort at the foot of the *Népál* hills, which border upon the kingdom of *Tirhut*: but Captain KINLOCH not being able to penetrate the hills, either on the *Sidáli* quarter or by the pass at *Ilaeapúr*, in the kingdom of *Mucwanpur*, the army of *Górc'há* returned to *Népál* to direct their operations against the city of *Cat'hmandú*, where GAINPREJAS was, who had applied for succour to the *English*. During the siege of *Cat'hmandú* the *Bráhmens* of *Górc'há* came almost every night into the city, to engage the chiefs of the people on the part of their king: and the more effectually to impose upon poor GAINPREJAS, many of the principal *Bráhmens* went to his house, and told him to persevere with confidence, that the chiefs of the *Górc'há* army were attached to his cause, and that even they themselves would deliver up their king PRITHWINA'RÁ'YAN into his hands. Having by these artifices procured an opportunity of detaching from his party all his principal subjects, tempting them with liberal promises according to their custom, one night the men of *Górc'há* entered the city without opposition; and the wretched GAINPREJAS, perceiving he was betrayed, had scarce time to escape with about three hundred of his best and most faithful *Hindústáni* troops towards *Lelit Pattan*; which place however he reached the same night.

THE king of *Górc'há* having made himself master of *Cat'hmandú* in the year 1768, persisted in the attempt of possessing himself also of the city of *Lelit Pattan*, promising all the nobles that he would suffer them to remain in the possession of their property, that he would even augment it; and, because the nobles of *Lelit Pattan* placed no reliance on the faith of his promises, he sent his domestic priest to make this protestation; that, if he failed

to acquit himself of his promise, he should draw curses upon himself and his family even to the fifth past and succeeding generation ; so that the unhappy GAINPREJAS and the king of *Lelit Pattan*, seeing that the nobility were disposed to render themselves subject to the king of *Górc'hà*, withdrew themselves with their people to the king of *B'hatgàn*. When the city of *Lelit Pattan* became subject to the king of *Górc'hà*, he continued for some time to treat the nobility with great attention, and proposed to appoint a viceroy of the city from among them. Two or three months afterwards, having appointed the day for making his formal entrance into the city of *Lelit Pattan*, he made use of innumerable stratagems to get into his possession the persons of the nobility, and in the end succeeded ; he had prevailed upon them to permit their sons to remain at court as companions of his son ; he had dispatched a noble of each house to *Naxacút*, or *New Fort*, pretending that the apprehensions he entertained of them had prevented his making a public entrance into the city ; and the remaining nobles were seized at the river without the town, where they went to meet him agreeably to a prior engagement. Afterwards he entered the city, made a visit to the temple of BAGHERO, adjoining to our habitation, and passing in triumph through the city amidst immense numbers of soldiers, who composed his train, entered the royal palace, which had been prepared for his reception : in the mean time parties of his soldiers broke open the houses of the nobility, seized all their effects, and threw the inhabitants of the city into the utmost consternation. After having caused all the nobles who were in his power to be put to death, or rather their bodies to be mangled in a horrid manner, he departed with a design of besieging *B'hatgàn* : and we obtained permission, through the interest of his son, to retire with all the *Christians* into the possessions of the *English*.

At the commencement of the year 1769, the king of *Gorc'hà* acquired possession of the city of *B'hatgán* by the same expedients to which he owed his former successes; and on his entrance with his troops into the city, GAINPREJAS, seeing he had no resource left to save himself, ran courageously with his attendants towards the king of *Gorc'hà*, and, at a small distance from his palanquin, received a wound in his foot, which a few days afterwards occasioned his death. The king of *Lelit Pattan* was confined in irons till his death; and the king of *B'hatgán*, being very far advanced in years, obtained leave to go and die at *Banares*. A short time afterwards, the mother of GAINPREJAS also procured the same indulgence, having from old age already lost her eye-sight; but before her departure, they took from her a necklace of jewels, as she herself told me, when she arrived at *Patna* with the widow of her grandson: and I could not refrain from tears, when I beheld the misery and disgrace of this blind and unhappy queen.

THE king of *Gorc'hà*, having thus in the space of four years effected the conquest of *Népál*, made himself master also of the country of the *Cirátas*, to the east of it, and of other kingdoms, as far as the borders of *Cóch Bihár*. After his decease, his eldest son, PRATA'P SINH, held the government of the whole country; but scarcely two years after, on PRAT'PA SINH's death, a younger brother, by name BAHAD'AR SA'H, who resided then at *Bettia* with his uncle DELMERDEN SA'H, was invited to accept of the government; and the beginning of his government was marked with many massacres. The royal family is in the greatest confusion, because the queen lays claim to the government in the name of her son, whom she had by PRATA'P SINH; and perhaps the oath violated by PRIT'HWI'NA'RA'YAN, will in the progress of time have its effect. Such have been the successors of the kingdoms of *Népál*, of which PRIT'HWI'NA'RA'YAN had thus acquired possession.

## XVIII.

### ON THE CURE OF PERSONS BITTEN BY SNAKES.

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BY JOHN WILLIAMS, ESQ.

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**T**HE following statement of facts relative to the cure of persons bitten by snakes, selected from a number of cases which have come within my own knowledge, require no prefatory introduction, as it points out the means of obtaining the greatest self-gratification the human mind is capable of experiencing,—that of the preservation of the life of a fellow-creature, and snatching him from the jaws of death, by a method which every person is capable of availing himself of. Eau de Luce, I learn from many communications which I have received from different parts of the country, answers as well as the pure Caustic Alkali Spirit; and though, from its having some essential oils in its composition, it may not be so powerful, yet, as it must be given with water, it only requires to increase the dose in proportion; and so long as it retains its milky white colour, it is sufficiently efficacious.

FROM the effect of a ligature applied between the part bitten and the heart, it is evident that the poison diffuses itself over the body by the returning venous blood; destroying the irritability, and rendering the system paralytic. It is therefore probable that the Volatile Caustic Alkali, in resisting the disease of the poison, does not act so much as a specific in destroying its quality as by counteracting the effect on the system, by stimulating the fibres, and preserving that irritability which it tends to destroy.

## CASE I.

IN the month of *August* 1780, a servant of mine was bitten in the heel, as he supposed, by a snake; and in a few minutes was in great agony, with convulsions about the throat and jaws, and continual grinding of the teeth. Having a wish to try the effects of Volatile Alkali in such cases, I gave him about forty drops of Eau de Luce in water, and applied some of it to the part bitten; the dose was repeated every eight or ten minutes, till a small phial was expended: it was near two hours before it could be said he was out of danger. A numbness and pricking sensation was perceived extending itself up to the knee, where a ligature was applied so tight as to stop the returning venous blood, which seemingly checked the progress of the deleterious poison. The foot and leg, up to where the ligature was made, were stiff and painful for several days; and, which appeared very singular, were covered with a branny scale.

THE above was the first case in which I tried the effects of the Volatile Alkali, and, apprehending that the essential oils in the composition of Eau de Luce, though made of the strong Caustic Volatile Spirit, would considerably diminish its powers, I was induced, the next opportunity that offered, to try the effects of pure Volatile Caustic Alkali Spirit, and accordingly prepared some from Quicklime and the Sal Ammoniac of this country.

## CASE II.

IN July 1782, a woman of the *Bráhmán* cast, who lived in my neighbourhood at *Chunár*, was bitten by a *Cobra de Capello* between the thumb and fore-finger of her right hand. Prayers and superstitious incantations were practised by the *Bráhmens* about her, till she became speechless and convulsed, with locked jaws, and a profuse discharge of saliva running from her

her mouth. On being informed of the accident, I immediately sent a servant with a bottle of the Volatile Caustic Alkali Spirit, of which he poured about a tea-spoon full, mixed with water, down her throat, and applied some of it to the part bitten. The dose was repeated a few minutes after, when she was evidently better, and in about half an hour was perfectly recovered.

THIS accident happened in a small hut, where I saw the snake, which was a middle-sized *Cobra de Capello*. The *Bráhmens* would not allow it to be killed. In the above case, no other means whatever were used for the recovery of the patient than are here recited.

#### CASE III.

A WOMAN-servant in the family of a gentleman at *Benares* was bitten in the foot by a *Cobra de Capello*: the gentleman immediately applied to me for some of the Volatile Caustic Alkali, which I fortunately had by me. I gave her about sixty drops in water, and also applied some of it to the part bitten: in about seven or eight minutes after, she was quite recovered. In the above case, I was not witness to the deleterious effect of the poison on the patient; but saw the snake after it was killed.

#### CASE IV.

In *July 1784*, the wife of a servant of mine was bitten by a *Cobra de Capello* on the outside of the little toe of her right foot. In a few minutes she became convulsed, particularly about the jaws and throat; with a continued gnashing of the teeth. She at first complained of a numbness extend-

ing from the wound upwards, but no ligature was applied to the limb. About sixty drops of the Volatile Caustic Spirit were given to her in water, by forcing open her mouth, which was strongly convulsed. In about seven minutes the dose was repeated, when the convulsions left her; and in three more she became sensible, and spoke to those who attended her. A few drops of the spirit had also been applied to the wound. The snake was killed and brought to me, which proved to be a *Cobra de Capella*.

#### CASE V.

As it is generally believed that the venom of snakes is more malignant during hot dry weather than at any other season, the following case, which occurred in the month of July 1788, when the weather was extremely hot, no rain, excepting a slight shower, having fallen for many months, may not be unworthy of notice.

A SERVANT belonging to an Officer at *Juanpoor*, was bitten by a snake on the leg, about two inches above the outer ankle. As the accident happened in the evening, he could not see what species of snake it was: he immediately tied a ligature above the part bitten, but was in a few minutes in such exquisite torture from pain, which extended up his body and to his head, that he soon became dizzy and senseless. On being informed of the accident, I sent my servant with a phial of the Volatile Caustic Alkali; who found him, when he arrived, quite torpid, with the saliva running out of his mouth, and his jaws so fast locked, as to render it necessary to use an instrument to open them and administer the medicine. About forty drops of the Volatile Caustic Spirit were given to him in water, and applied to the wound; and the same dose repeated a few minutes after. In about half an hour he

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was perfectly recovered. On examining the part bitten, I could discover the marks of three fangs; two on one side, and one on the other; and, from the distance they were asunder, I should judge it a large snake. More than ten minutes did not appear to have elapsed from the time of his being bitten till the medicine was administered. The wounds healed immediately; and he was able to attend to his duty the next day. Though the species of snake was not ascertained, yet I judge from the flow of saliva from the mouth, convulsive spasms of the jaws and throat, as well as from the marks of three fangs, that it must have been a *Cobra de Capello*; and, though I have met with five and six fangs of different sizes in snakes of that species, I never observed the marks of more than two having been applied in biting in any other case which came within my knowledge.

## C A S E VI.

IN September 1786, a servant belonging to Captain S—, who was then at *Benares*, was bitten in the leg by a large *Cobra de Capello*. He saw the snake coming towards him, with his neck spread out in a very tremendous manner, and endeavoured to avoid him; but, before he could get out of his way, the snake seized him by the leg, and secured his hold for some time, as if he had not been able to extricate his teeth. Application was immediately made to his master for a remedy, who sent to consult me; but, before I arrived, had given him a quantity of sweet oil, which he drank. So soon as I saw him, I directed the usual dose of Volatile Caustic Alkali to be given, which fortunately brought away the oil from his stomach, or it is probable that the stimulating effect of the Volatile Spirit would have been so much blunted by it, as to have become inefficacious. A second dose was immediately administered, and some time after a third. The man recovered  
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in the course of a few hours. As oil is frequently administered as a remedy in the bite of snakes, I think it necessary to caution against the use of it with the Volatile Alkali, as it blunts the stimulating quality of the spirit, and renders it useless.

OF the numerous species of snakes which I have met with, not above six were provided with poisonous fangs; though I have examined many which have been considered by the natives as dangerous, without being able to discover any thing noxious in them.

THE following is an instance of the deleterious effect of the bite of a snake, called by the natives *Krait*, a species of the *Boa*, which I have frequently met with in this part of the country.

#### CASE VII.

ON the 16th *September* 1788, a man was brought to me who had been bitten by a snake, with the marks of two fangs on two of his toes; he was said to have been bitten above an hour before I saw him: he was perfectly sensible, but complained of great pain in the parts bitten, with an universal languor. I immediately gave him thirty drops of the Volatile Caustic Alkali Spirit in water, and applied some of it to the wounds: in a few minutes he became easier, and in about half an hour was carried away by his friends, with perfect confidence in his recovery, without having taken a second dose of the medicine, which indeed did not appear to have been necessary; but whether from the effect of the bite of the snake, or the motion of the dooly on which he was carried, I know not; but he became sick at the stomach, threw up the medicine, and died in about a quarter of an hour after. The man said, that the snake came up to him

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while he was sitting on the ground; and that he put him away with his hand once, but that he turned about and bit him as described. The snake was brought to me, which I examined; it was about two feet and a half long, of a lightish brown colour on the back, a white belly, and annulated from end to end with 208 abdominal, and forty-six tail scuta. I have met with several of them from thirteen inches to near three feet in length. It had two poisonous fangs in the upper jaw, which lay naked, with their points without the upper lip. It does not spread its neck, like the *Cobra de Capello*, when enraged; but is very active and quick in its motion.

I HAVE seen instances of persons bitten by snakes, who have been so long without assistance, that, when they have been brought to me they have not been able to swallow, from convulsions of the throat and fauces, which is, I observe, a constant symptom of the bite of the *Cobra de Capello*; and indeed I have had many persons brought to me who had been dead some time; but never knew an instance of the Volatile Caustic Alkali failing in its effect, where the patient has been able to swallow it.



## XIX.

### ON SOME ROMAN COINS FOUND AT NELORE.

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TO THE PRESIDENT OF THE ASIATIC SOCIETY.

SIR,

I HAVE the honour to present you with an extract of a letter from Mr. ALEXANDER DAVIDSON, late Governor of *Madras*, giving an account of some *Roman Coins* and *Medals* lately found near *Nelôr*, together with a drawing of them, copied from one transmitted by Mr. DAVIDSON; which, I imagine, may be acceptable to the *Asiatic Society*.

I have the honour to be,

SIR,

Your most obedient humble servant,

S. DAVIS.

*Calcutta, March 20, 1788.*

## EXTRACT OF A LETTER FROM ALEXANDER DAVIDSON, ESQ.

DATED MADRAS, JULY 12, 1787.

AS a peasant near *Nelòr*, about 100 miles north-west of *Madras*, was ploughing on the side of a stony craggy hill, his plough was obstructed by some brickwork : he dug, and discovered the remains of a small *Hindu* temple, under which a little pot was found with *Roman* coins and medals of the second century.

HE sold them as old gold ; and many, no doubt, were melted ; but the *Nawáb AMÍ'RUL UMARA'* recovered upwards of thirty of them. This happened while I was Governor ; and I had the choice of two out of the whole. I chose an *ADRIAN* and a *FAUSTINA*.

SOME of the *TRAJANS* were in good preservation. Many of the coins could not have been in circulation : they were all of the purest gold, and many of them as fresh and beautiful as if they had come from the mint but yesterday : some were much defaced and perforated, and had probably been worn as ornaments on the arm, and others pending from the neck.

I SEND you drawings of my two Coins, and have no objection to your publishing an account of them in the Transactions of the *Asiatic Society*. I received my information respecting them from the young *Nawáb* ; and if my name be necessary to authenticate the facts I have related, you have my permission to use it.

## XX.

### ON TWO HINDU FESTIVALS, AND THE INDIAN SPHINX.

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BY THE LATE COLONEL PEARSE, MAY 12, 1785.

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I BEG leave to point out to the Society, that the *Sunday* before last was the festival of BHAVA'NI', which is annually celebrated by the *Gôpas*, and all other *Hindus* who keep horned cattle for use or profit : on this feast they visit gardens, erect a pole in the fields, and adorn it with pendants and garlands. The *Sunday* before last was our *first* of *May*, on which the same rites are performed by the same class of people in *England*, where it is well known to be a relique of ancient superstition in that country : it should seem, therefore, that the religion of the East and the old religion of *Britain* had a strong affinity. BHAVA'NI' has another festival ; but that is not kept by any one set of *Hindus* in particular, and this is appropriated to one class of people : this is constantly held on the *ninth* of *Baijâc'h* ; which does not always fall on our *first* of *May*, as it did this year. Those members of the Society who are acquainted with the rules which regulate the festivals, may be able to give better information concerning this point : I only mean to point out the resemblance of the rites performed here and in *England*, but must leave abler hands to investigate the matter further, if it should be thought deserving of the trouble. I find that the festival which I have mentioned, is one of the most ancient among the *Hindus*.

II. DURING the *Hûli*, when mirth and festivity reign among *Hindus* of every class, one subject of diversion is to send people on errands and expeditions that are to end in disappointment, and raise a laugh at the expence of the person sent. The *Hûli* is always in *March*, and the last day is the greatest holiday. All the *Hindus* who are on that day at *Jagannât'h*, are entitled to certain distinctions, which they hold to be of such importance, that I found it expedient to stay there till the end of the festival; and I am of opinion, and so are the rest of the officers, that I saved above five hundred men by the delay. The origin of the *Hûli* seems lost in antiquities; and I have not been able to pick up the smallest account of it.

IF the rites of MAY-DAY show any affinity between the religion of *England* in times past, and that of the *Hindus* in these times, may not the custom of making *April-fools*, on the first of that month, indicate some traces of the *Hûli*? I have never yet heard any account of the origin of the *English* custom; but it is unquestionably very ancient, and is still kept up even in great towns, though less in them than in the country. With us it is chiefly confined to the lower classes of people; but in *India* high and low join in it; and the late SHUJA'UL DAULAH, I am told, was very fond of making *Hûli*-fools, though he was a *Musselman* of the highest rank. They carry it here so far, as to send letters making appointments, in the names of persons who, it is known, must be absent from their house at the time fixed on; and the laugh is always in proportion to the trouble given.

III. AT *Jagannât'h* I found the *Sphinx* of the *Egyptians*; and present the Society with a drawing of it. MURĀ'RĪ Pandit, who was deputy *Faujdar* of *Balafor*, attended my detachment on the part of the *Mahrâtas*:

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he is now the principal *Paujdâr*, and is much of the gentleman, a man of learning, and very intelligent. From him I learned, that the *Sphinx*, here called *Singh*, is to appear at the end of the world, and, as soon as he is born, will prey on an elephant: he is, therefore, figured seizing an elephant in his claws, and the elephant is made small, to show that the *Singh*, even a moment after his birth, will be very large in proportion to it.

WHEN I told MURA'RI that the *Egyptians* worshipped a bull, and chose the God by a black mark on his tongue, and that they adored birds and trees, he immediately exclaimed, "their religion then was the same with ours; for we also chose our *sacred bulls* by the *same marks*; we reverence the "*hanfa*, the *garura*, and other birds; we respect the *pippal* and the "*vata* among trees, and the *tulasi* among shrubs; but as for onions," which I had mentioned, "they are eaten by low men, and are fitter to be "eaten than worshipped."

## REMARK BY THE PRESIDENT.

WITHOUT presuming to question the authority of MURA'RI *Pandit*, I can only say, that several *Brâhmins*, now in *Bengal*, have seen the figure at *Jagmât'h*, where one of the gates is called *Sinhadwâr*; and they assure me that they always considered it as a mere representation of a *Lion* seizing a young elephant; nor do they know, they say, any sense for the word *Sinha*, but a *Lion*, such as Mr. HASTINGS kept near his garden. The *Hûli*, called *Hôlucà* in the *Vêdas*, and *P'halgûsarva* in common *Sanserit* books, is the festival of the vernal season, or *Naurûz* of the *Perfians*.



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## XXI.

### A SHORT DESCRIPTION OF CARNICOBAR,

BY MR. G. HAMILTON.

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COMMUNICATLD BY MR. ZOFFANY.

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THE island of which I propose to give a succinct account, is the northernmost of that cluster in the *Bay of Bengal*, which goes by the name of the *Nicobars*. It is low, of a round figure, about forty miles in circumference, and appears at a distance as if entirely covered with trees. However, there are several well-cleared and delightful spots upon it. The soil is a black kind of clay, and marshy. It produces in great abundance, and with little care, most of the tropical fruits; such as pine-apples, plantains, papayas, cocoa-nuts, and areca-nuts; also excellent yams, and a root called *cachu*. The only four-footed animals upon the island are hogs, dogs, large rats, and an animal of the lizard kind, but large, called by the natives *tolongui*; these frequently carry off fowls and chickens. The only kind of poultry are hens, and those not in great plenty. There are abundance of snakes of many different kinds; and the inhabitants frequently die of their bites. The timber upon the island is of many sorts, in great plenty, and some of it remarkably large, affording excellent materials for building or repairing ships.

THE natives are low in stature but very well made, and surprisingly active and strong; they are copper-coloured, and their features have a cast of the *Mahy*; quite the reverse of elegant. The women in particular are extremely ugly. The men cut their hair short; and the women have their heads shaved quite bare, and wear no covering but a short petticoat, made of a sort of rush, or dry grass, which reaches half-way down the thigh. This grass is not interwoven, but hangs round the person, something like the thatching of a house. Such of them as have

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received presents of cloth-petticoats from the ships, commonly tie them round immediately under the arms. The men wear nothing but a narrow strip of cloth about their middle, in which they wrap up their privities so tight, that there is hardly any appearance of them. The ears of both sexes are pierced when young, and by squeezing into the holes large plugs of wood, or hanging heavy weights of shells, they contrive to render them wide, and disagreeable to look at. They are naturally supposed to be good humoured and gay, and are very fond of sitting at table with *Europeans*, where they eat every thing that is set before them; and they eat most enormously. They do not care much for wine, but will drink bumpers of arrack as long as they can see. A great part of their time is spent in feasting and dancing. When a feast is held at any village, every one that chuses goes uninvited, for they are utter strangers to ceremony. At those feasts they eat immense quantities of pork, which is their favourite food. Their hogs are remarkably fat, being fed upon the cocoa-nut kernel and sea-water; indeed all their domestic animals, fowls, dogs, &c. are fed upon the same. They have likewise plenty of small sea-fish, which they strike very dexterously with lances, wading into the sea about knee-deep. They are sure of killing a very small fish at ten or twelve yards distance. They eat the pork almost raw, giving it only a hasty grill over a quick fire. They roast a fowl by running a piece of wood through it, by way of spit, and holding it over a brisk fire until the feathers are burnt off, when it is ready for eating, in their taste. They never drink water; only cocoa-nut milk and a liquor called *foura*, which oozes from the cocoa-nut tree after cutting off the young sprouts or flowers. This they suffer to ferment before it is used, and then it is intoxicating; to which quality they add much by their method of drinking it, by sucking it slowly through a small straw. After eating, the young men and women, who  
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are fancifully dreft with leaves, go to dancing, and the old people furround them, fmoking *tobacco* and drinking *foura*. The dancers, while performing, fing fome of their tunes, which are far from wanting harmony, and to which they keep exact time. Of mufical instruments they have only one kind, and that the fimpleft. It is a hollow bamboo, about  $2\frac{1}{2}$  feet long, and three inches in diameter, along the outside of which there is ftretched from end to end a fingle ftring made of the threads of a fplit cane; and the place under the ftring is hollowed a little, to prevent it from touching. This instrument is played upon in the fame manner as a guitar. It is capable of producing but few notes; the performer however makes it fpeak harmonioufly, and generally accompanies it with the voice.

WHAT they know of phyfic is fmall and fimple. I had once occafion to fee an operation in furgery performed on the toe of a young girl, who had been ftung by a fcorpion, or centipee. The wound was attended with a confiderable fwelling; and the little patient feemed in great pain. One of the natives produced the under jaw of a fmall fifh, which was long, and planted with two rows of teeth as fharp as needles. Taking this in one hand, and a fmall ftick by way of hammer in the other, he ftuck the teeth three or four times into the fwelling, and made it bleed freely: the toe was then bound up with certain leaves; and next day the child was running about perfectly well.

THEIR houfes are generally built upon the beach in villages of fifteen or twenty houfes each; and each houfe contains a family of twenty perfons and upwards. Thefe habitations are raifed upon wooden pillars about ten feet from the ground; they are round, and, having no windows, look like bee-hives, covered with thatch. The entry is through a trap-

door below, where the family mount by a ladder, which is drawn up at night. This manner of building is intended to secure the houses from being infested with snakes and rats; and for that purpose the pillars are bound round with a smooth kind of leaf, which prevents animals from being able to mount; besides which, each pillar has a broad round flat piece of wood near the top of it, the projecting of which effectually prevents the further progress of such vermin as may have passed the leaf. The flooring is made with thin strips of bamboos, laid at such distances from one another as to leave free admission for light and air; and the inside is neatly finished, and decorated with fishing-lances, nets, &c.

THE art of making cloth of any kind is quite unknown to the inhabitants of this island; what they have is got from the ships that come to trade in cocoa-nuts. In exchange for their nuts (which are reckoned the finest in this part of *India*) they will accept of but few articles: what they chiefly wish for is cloth of different colours, hatchets, and hanger-blades, which they use in cutting down the nuts. Tobacco and arrack they are very fond of; but expect these in presents. They have no money of their own, nor will they allow any value to the coin of other countries, further than as they happen to fancy them for ornaments; the young women sometimes hanging strings of dollars about their necks. However, they are good judges of gold and silver; and it is no easy matter to impose base metals upon them as such.

THEY purchase a much larger quantity of cloth than is consumed upon their own island. This is intended for the *Choury* market. *Choury* is a small island to the southward of theirs, to which a large fleet of their boats sails every year, about the month of *November*, to exchange cloth for

*canoes;*

*canoes* ; for they cannot make these themselves. This voyage they perform by the help of the sun and stars, for they know nothing of the compass.

IN their disposition there are two remarkable qualities. One is their entire neglect of compliment and ceremony ; and the other, their aversion to dishonesty. A *Carnicobarian* travelling to a distant village upon business or amusement, passes through many towns in his way, without perhaps speaking to any one. If he is hungry, or tired, he goes up into the nearest house, and helps himself to what he wants, and sits till he is rested, without taking the smallest notice of any of the family, unless he has business or news to communicate. Theft or robbery is so very rare amongst them, that a man going out of his house never takes away his ladder, or shuts his door, but leaves it open for any body to enter that pleases, without the least apprehension of having any thing stolen from him.

THEIR intercourse with strangers is so frequent, that they have acquired in general the barbarous *Portuguese* language, so common over *India*. Their own has a sound quite different from most others, their words being pronounced with a kind of stop, or catch in the throat, at every syllable. The few following words will serve to shew those who are acquainted with other *Indian* languages, whether there is any similitude between them.

A man,	<i>Kegonia.</i>	To eat,	<i>Gnia.</i>
A woman,	<i>Kecanna.</i>	To drink,	<i>Okk.</i>
A child,	<i>Chu.</i>	Yams,	<i>T'owla.</i>
To laugh	<i>Ayelaur.</i>	To weep,	<i>Poing.</i>
A canoe,	<i>App.</i>	A pine-apple,	<i>Fruing.</i>

A house,	<i>Albanum.</i>	To sleep,	<i>Loom loom.</i>
A fowl,	<i>Haydm.</i>	A dog,	<i>T'amam.</i>
A hog,	<i>Hawm.</i>	Fire,	<i>T'amia.</i>
Fish,	<i>Ka.</i>	Rain,	<i>Koomra.</i>

THEY have no notion of a God, but they believe firmly in the Devil, and worship him from fear. In every village there is a high pole erected, with long strings of ground-rattans hanging from it, which, it is said, has the virtue to keep him at a distance. When they see any signs of an approaching storm, they imagine that the Devil intends them a visit; upon which many superstitious ceremonies are performed. The people of every village march round their own boundaries, and fix up at different distances small sticks split at the top, into which split they put a piece of cocoa-nut, a wisp of tobacco, and the leaf of a certain plant. Whether this is meant as a peace-offering to the Devil, or a scare-crow to frighten him away, does not appear.

WHEN a man dies, all his live stock, cloth, hatchets, fishing-lances, and in short every moveable thing he possessed is buried with him, and his death is mourned by the whole village. In one view this is an excellent custom, seeing it prevents all disputes about the property of the deceased amongst his relations. His wife must conform to custom, by having a joint cut off from one of her fingers; and, if she refuses this, she must submit to have a deep notch cut in one of the pillars of her house.

I WAS once present at the funeral of an old woman. When we went into the house which had belonged to the deceased, we found it full of her female relations. Some of them were employed in wrapping up the corpse  
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in leaves and cloth, and others tearing to pieces all the cloth which had belonged to her. In another house hard by, the men of the village, with a great many others from the neighbouring towns, were sitting drinking *foura* and smoking tobacco. In the mean time two stout young fellows were busy digging a grave in the sand near the house. When the women had done with the corpse, they set up a most hideous howl, upon which the people began to assemble round the grave, and four men went up into the house to bring down the body; in doing this they were much interrupted by a young man, son to the deceased, who endeavoured with all his might to prevent them, but finding it in vain, he clung round the body, and was carried to the grave along with it: there, after a violent struggle, he was turned away, and conducted back to the house. The corpse being now put into the grave, and the lashings, which bound the legs and arms, cut, all the live stock which had been the property of the deceased, consisting of about half a dozen hogs, and as many fowls, were killed, and flung in above it: a man then approached with a bunch of leaves stuck upon the end of a pole, which he swept two or three times gently along the corpse, and then the grave was filled up. During the ceremony the women continued to make the most horrible vocal concert imaginable: the men said nothing. A few days afterwards a kind of monument was erected over the grave, with a pole upon it, to which long strips of cloth of different colours were hung.

POLYGAMY is not known among them; and their punishment of adultery is not less severe than effectual. They cut, from the man's offending member, a piece of the foreskin proportioned to the frequent commission or enormity of the crime.

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THERE seems to subsist among them a perfect equality. A few persons, from their age, have a little more respect paid to them ; but there is no appearance of authority one over another. Their society seems bound rather by mutual obligations continually conferred and received : the simplest and best of all ties.

THE inhabitants of the *Andamans* are said to be *Cannibals*. The people of *Carnicobar* have a tradition among them, that several canoes came from *Andaman* many years ago, and that the crews were all armed, and committed great depredations, and killed several of the *Nicobarians*. It appears at first remarkable that there should be such a wide difference between the manners of the inhabitants of islands so near to one another ; the *Andamans* being savage *Cannibals*, and the others the most harmless inoffensive people possible. But it is accounted for by the following historical anecdote, which I have been assured is matter of fact. Shortly after the *Portuguese* had discovered the passage to *India* round the *Cape of Good Hope*, one of their ships, on board of which were a number of *Mozambique* negroes, was lost on the *Andaman Islands*, which were till then uninhabited. The blacks remained on the island and settled there : the *Europeans* made a small shallop, in which they sailed to *Pegu*. On the other hand, the *Nicobar Islands* were peopled from the opposite main and the coast of *Pegu* ; in proof of which the *Nicobar* and *Pegu* languages are said, by those acquainted with the latter, to have much resemblance.

## XXII.

### THE DESIGN OF A TREATISE ON THE PLANTS OF INDIA.

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BY THE PRESIDENT.

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THE greatest, if not the only, obstacle to the progress of knowledge in these provinces, except in those branches of it which belong immediately to our several professions, is our want of leisure for general researches; and, as ARCHIMEDES, who was happily master of his time, had not *space* enough to move the greatest weight with the smallest force, thus we, who have ample space for our inquiries, really want *time* for the pursuit of them. “Give me a place to stand on,” said the great mathematician, “and I will move the whole earth:” *Give us time*, we may say, *for our investigations, and we will transfer to Europe all the sciences, arts, and literature of Asia.* “Not to have despaired,” however, was thought a degree of merit in the *Roman General*, even though he was defeated, and, having some hope that others may occasionally find more leisure than it will ever, at least in this country, be my lot to enjoy, I take the liberty to propose a work, from which very curious information, and possibly very solid advantage, may be derived.

SOME hundreds of plants, which are yet imperfectly known to *European* botanists, and with the virtues of which they are wholly unacquainted, grow wild on the plains and in the forests of *India*: the *Amarcôsh*, an excellent vocabulary of the *Sanscrit* language, contains in one chapter the names of about three hundred medicinal vegetables; the *Médimi* may com-  
prize

prize many more; and the *Dravyābhidhāna*, or *Dictionary of Natural Productions*, includes, I believe, a far greater number; the properties of which are distinct'y related in medical tracts of approved authority. Now the first step, in compiling a treatise on the plants of *India*, should be to write their true names in *Roman* letters, according to the most accurate orthography, and in *Sanscrit* preferably to any vulgar dialect; because a learned language is fixed in books, while popular idioms are in constant fluctuation, and will not perhaps be understood a century hence by the inhabitants of these *Indian* territories, whom future botanists may consult on the common appellations of trees and flowers. The childish denominations of plants from the persons who first described them, ought wholly to be rejected; for *Champaca* and *Hinna* seem to me not only more elegant, but far properer designations of an *Indian* and an *Arabian* plant, than *Michelia* and *Lavesonia*; nor can I see without pain, that the great *Swedish* botanist considered it as *the supreme and only reward of labour* in this part of natural history, to preserve a name by hanging it on a blossom, and that he declared this mode of promoting and adorning botany, worthy of being *continued with holy reverence*, though so high an honour, he says, *ought to be conferred with chaste reserve, and not prostituted for the purpose of conciliating the good-will, or eternalising the memory of any but his chosen followers; no, not even of saints*. His list of *an hundred and fifty* such names clearly shows that his excellent works are the true basis of his just celebrity, which would have been feebly supported by the stalk of the *Linnaea*. From what proper name the *Plantain* is called *Musa*, I do not know; but it seems to be the *Dutch* pronunciation of the *Arabic* word for that vegetable, and ought not, therefore, to have appeared in his list, though, in my opinion, it is the only rational name in the muster-roll. As to the system of LINNÆUS, it is the system of Nature, subordinate indeed to the beautiful arrangement of *natural orders*,

of

of which he has given a rough sketch, and which may hereafter, perhaps, be completed : but the distribution of vegetables into *classes*, according to the number, length, and position of the stamens and pistils, and of those *classes* into *kinds* and *species*, according to certain marks of discrimination, will ever be found the clearest and most convenient of methods, and should therefore be studiously observed in the work which I now suggest ; but I must be forgiven if I propose to reject the *Lamæan* appellations of the twenty-four *classes*, because, although they appear to be *Greek* (and, if they really were so, that alone might be thought a sufficient objection) yet in truth they are not *Greek*, nor even formed by analogy to the language of *Greeks* ; for *Polygamos*, *Monandros*, and the rest of that form, are both masculine and feminine ; *Polyandria*, in the abstract, never occurs, and *Polyandrium* means a public cemetery ; *diæcea* and *diærus* are not found in books of authority ; nor, if they were, would they be derived from *dis*, but from *dia*, which would include the *træcia*. Let me add, that the *twelfth* and *thirteenth* classes are ill distinguished by their appellations, independently of other exceptions to them, since the real distinction between them consists not so much in the *number* of their stamens as in the *place* where they are inserted ; and that the *fourteenth* and *fifteenth* are not more accurately discriminated by two words formed in defiance of grammatical analogy, since there are but *two* powers, or two *diversities of length*, in each of those classes. *Calycopolyandros* might, perhaps, not inaccurately denote a flower of the *twelfth* class ; but such a compound would still favour of barbarism or pedantry ; and the best way to amend such a system of words is to efface it, and supply its place by a more simple nomenclature, which may easily be found. Numerals may be used for the *eleven* first classes, the former of two numbers being always appropriated to the *stamens*, and the latter to the *pistils* : short phrases, as, *on the calyx*

or calice, in the receptacle, two long, four long, from one base, from two or many bases, with anthers connected on the pistils, in two flowers, in two distinct plants, mixed, concealed, or the like, will answer every purpose of discrimination; but I do not offer this as a perfect substitute for the words which I condemn. The allegory of *sexes* and *nuptials*, even if it were complete, ought, I think, to be discarded, as unbecoming the gravity of men, who, while they search for truth, have no business to inflame their imaginations; and, while they profess to give descriptions, have nothing to do with metaphors. Few passages in *Aloisia*, the most impudent book ever composed by man, are more wantonly indecent than the hundred-and-forty-sixth number of the *Botanical Philosophy*, and the broad comment of its grave author, who *dares*, like OCTAVIUS in his epigram, *to speak with Roman simplicity*; nor can the *Linnean* description of the *Arum*, and many other plants, be read in *English*, without exciting ideas which the occasion does not require. Hence it is, that no well-born and well educated woman can be advised to amuse herself with botany, as it is now explained, though a more elegant and delightful study, or one more likely to assist and embellish other female accomplishments, could not possibly be recommended.

WHEN the *Sanferit* names of the *Indian* plants have been correctly written in a large paper-book, one page being appropriated to each, the fresh plants themselves, procured in their respective seasons, must be concisely, but accurately, *classed* and *described*; after which their several *uses* in medicine, diet, or manufactures, may be collected, with the assistance of *Hindu* physicians, from the medical books in *Sanferit*, and their accounts either disproved or established by repeated experiments, as fast as they can be made with exactness.

By way of example, I annex the descriptions of five *Indian* plants, but am unable, at this season, to re-examine them, and wholly despair of leisure to exhibit others, of which I have collected the names, and most of which I have seen in blossom.

## I. MUCHUCUNDA.

*Twenty, from One Base.*

*Cal.* Five-parted, thick ; leaflets oblong.

*Cor.* Five petals, oblong.

*Stam.* From twelve to fifteen, rather long, fertile ; five shorter, sterile-  
In some flowers, the *unprolific* stamens longer.

*Pist.* Style cylindric.

*Peric.* A capsule, with five cells, many-seeded.

*Seeds*, roundish, compressed, winged.

*Leaves*, of many different shapes.

*Uses.* The quality refrigerant.

ONE flower, steeped a whole night in a glass of water, forms a cooling mucilage of use in virulent gonorrhœas. The *Muchucunda*, called also *Pichuca*, is exquisitely fragrant : its calyx is covered with an odoriferous dust ; and the dried flowers in fine powder, taken like snuff, are said, in a *Sanscrit* book, almost instantaneously to remove a nervous head-ach.

*Note.* This plant differs a little from the *Pentapetes* of LINNÆUS.

## II. BILVA, OR MA'LURĀ.

*Many on the Receptacle, and One.*

*Cal.* Four or five, cleft beneath.

X x 2

*Cor.*

*Cor.* Four or five petals ; mostly reflex.

*Stam.* Forty to forty-eight filaments ; anthers mostly erect.

*Pist.* *Germ* roundish ; *Style* smooth, short ; *Stigma* clubbed.

*Peric.* A spheriodal berry, very large ; many-seeded.

*Seeds*, toward the surface, ovate, in a pellucid mucus.

*Leaves* ternate ; common petiole, long ; leaflets, subovate, obtusely notched, with short petioles ; some almost lanced.

*Stem* armed with sharp thorns.

*Uses.* The fruit nutritious, warm, cathartic ; in taste, delicious ; in fragrance, exquisite : its aperient and deterfive quality, and its efficacy in removing habitual costiveness, have been proved by constant experience. The mucus of the seed is, for some purposes, a very good cement.

*Note.* This fruit is called *Srip'hala*, because it sprang, say the *Indian* poets, from the milk of *Sri*, the goddess of abundance, who bestowed it on mankind at the request of *ISWARA*, whence he alone wears a chaplet of *Bilva* flowers ; to him only the *Hindus* offer them ; and, when they see any of them fallen on the ground, they take them up with reverence, and carry them to his temple. From the first blossom of this plant, that I could inspect, I had imagined that it belonged to the same class with the *Durio*, because the filaments appeared to be distributed in five sets ; but in all that I have since examined, they are perfectly distinct.

### III. SRINGATACA.

*Four and One.*

*Cal.* Four cleft, with a long peduncle above.

*Cor.* Four petals.

*Siam.*

*Stam.* Anthers kidney-shaped,

*Pist.* Germ roundish; *Style* long as the filaments; *Stigma* clubbed.

*Seed*, a nut with four opposite angles (two of them *sharp* thorns) formed by the *Calyx*.

*Leaves.* Those which float on the water are rhomboïdal; the two upper sides unequally notched; the two lower, right lines. Their petioles buoyed up by spindle-shaped spongy substances, not bladders.

*Root*, knotty, like coral.

*U/s.* The fresh kernel, in sweetness and delicacy, equals that of the filbert. A mucus, secreted by minute glands, covers the wet leaves, which are considered as cooling.

*Note.* It seems to be the floating *Trapa* of LINNÆUS.

#### IV. PUTI CARAJA.

*Ten and One.*

*Cal.* Five-cleft.

*Cor.* Five equal petals.

*Peric.* A thorny legumen; two seeds.

*Leaves* oval, pinnated.

*Stem.* Armed.

*U/s.* The seeds are very bitter, and, perhaps tonic; since one of them, bruised and given in two doses, will, as the *Hindus* assert, cure an intermittent fever.

#### V. MADHUCA. (See Vol. I. page 300.)

*Many, not on the Receptacle, and One.*

*Cal.* *Perianth* four or five-leaved.

*Cor.*



*Cor.* One-petaled. *Tube* inflated, fleshy. *Border* nine, or ten, parted.

*Stam.* *Anthers* from twelve to twenty-eight, erect, acute, subvillous.

*Pist.* *Germ* roundish; *Style* long, awl-shaped.

*Peric.* A *drupe*, with two or three *nuts*?

*Leaves* oval, somewhat pointed.

*Uses.* The *tubes* esculent, nutritious; yielding, by distillation, an inebriating spirit, which, if the sale of it were duly restrained by law, might be applied to good purposes. A useful oil is expressed from the seed.

*Note.* It resembles the *Bassia* of KOENIG.

SUCH would be the method of the work which I recommend; but even the specimen which I exhibit, might, in skilful hands, have been more accurate. Engravings of the plants may be annexed; but I have more than once experienced, that the best anatomical and botanical prints give a very inadequate, and sometimes a very false, notion of the objects which they were intended to represent. As we learn a new language, by reading approved compositions in it with the aid of a Grammar and Dictionary, so we can only study with effect the natural history of vegetables by analysing the plants themselves with the *Philosophia Botanica*, which is the *Grammar*, and the *Genera et Species Plantarum*, which may be considered as the *Dictionary* of that beautiful language in which Nature would teach us what plants we must avoid as noxious, and what we must cultivate as salutary, for that the qualities of plants are in some degree connected with the natural orders and classes of them, a number of instances would abundantly prove.

## XXIII.

### ON THE DISSECTION OF THE PANGOLIN.

IN A LETTER TO GENERAL CARNAC,  
FROM ADAM BURT, ESQ.

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COMMUNICATED BY THE GENERAL.

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SIR,

IN compliance with your desire, I most willingly do myself the honour to present to you my observations and reflections on the dissection of one of those animals, of which we have a print, with a very short account, in the FIRST VOL. of the TRANSACTIONS of the ASIATIC SOCIETY. The animal from which that likeness has been taken, was sent by Mr. LESLIE, from *Chitra*, to the President Sir WILLIAM JONES. It is distinguished in the TRANSACTIONS by a name which I do not at present remember; but probably the animal is of the same genus with the *Manis*, as described in the former edition of ENCYCLOPÆDIA BRITANNICA, or, perhaps, not different from the *Pangolin* of BUFFON.

THE representation of this animal in the MEMOIRS of the ASIATIC SOCIETY, makes it unnecessary for me to enter into any general description of its external figure and appearance. There are on each foot five claws, of which the outer and inner are small when compared with the other three. There are no distinct toes; but each nail is movable by a joint at its root. This creature is extremely inoffensive. It has *no teeth*; and its feet are unable to grasp. Hence it would appear, that Nature, having furnished it with a coat of mail for its protection, has, with some regard to justice, denied it the powers of acting with hostility against its fellow-creatures. The nails are well adapted for digging in the ground; and the animal is so dexterous in

cluding

cluding its enemies by concealing itself in holes and among rocks, that it is extremely difficult to procure one.

THE upper jaw is covered with a cross cartilaginous ridge, which though apparently not at all suited to any purposes of mastication, may, by encreasing the surface of the palate, extend the sense of taste. The œsophagus admitted my forefinger with ease. The tongue, at the bottom of the mouth, is nearly about the size of the little finger, from whence it tapers to a point. The animal at pleasure protrudes this member a great way from the mouth. The tongue arises from the ensiform cartilage and the contiguous muscles of the belly, and passes in form of a round distinct muscle from over the stomach, through the thorax, immediately under the sternum, and interior to the windpipe in the throat. When dissected out, the tongue could be easily elongated so as to reach more than the length of the animal, exclusive of its tail. There is a cluster of salivary glands seated around the tongue, as it enters the mouth. These will necessarily be compressed by the action of the tongue, so as occasionally to supply a plentiful flow of their secretion.

THE stomach is *cartilaginous*, and analogous to that of the gallinaceous tribe of birds. It was filled with small stones and gravel, which in this part of the country are almost universally calcareous. The inner surface of the stomach was rough to the feel, and formed into folds, the interstices of which were filled with a frothy secretion. The guts were filled with a sandy pulp, in which, however, were interspersed a few distinct small stones. No vestiges of any animal or vegetable food could be traced in the whole *primæ viæ*. The gall-bladder was distended, with a fluid resembling in colour and consistence the dregs of beer.

THE subject was a female : its duggs were two, seated on the breast. The uterus and organs of generation were evidently those of a viviparous animal.

FORCIBLY struck with the phenomena which this quadruped exhibited, my imagination at once overleaped the boundaries by which Science endeavours to circumscribe the productions and the ways of Nature ; and, believing with BUFFON, *que tout ce qui peut être est*, I did not hesitate to conjecture that this animal might possibly derive its nourishment from mineral substances. This idea I accordingly hazarded in an address to Colonel KYD. The spirit of inquiry natural to that gentleman, could be ill satisfied by ideas thrown out apparently at random ; and he soon called on me to explain my opinion and its foundation.

THOUGH we have perhaps no clear idea of the manner in which vegetables extract their nourishment from earth, yet the fact being so, it may not be unreasonable to suppose that some animal may derive nutriment by a process somewhat similar. It appears to me, that facts produced by SPALLANZANI directly invalidate the experiments, from which he has drawn the inference, that fowls swallow stones merely from stupidity ; and that such substances are altogether unnecessary to those animals. He reared fowls, without permitting them ever to swallow sand or stones ; but he also established the fact, that carnivorous animals may become frugivorous ; and herbivorous animals may come to live on flesh. A wood-pigeon he brought to thrive on putrid meat. The experiment on fowls, then, only corroborates the proof, that we have it in our power by habits to alter the natural constitution of animals. Again, that eminent investigator of truth found, that fowls died when fed on stones alone ; but surely

that fact is far short of proving that such substances are not agreeable to the original purposes of nature in the digestive process of these animals. When other substances shall have been detected in the stomach of this animal, my inference, from what I have seen, must necessarily fall to the ground. But if, like other animals with muscular and cartilaginous stomachs, this singular quadruped consumes grain, it must be surprizing that no vestige of such food was found present in the whole alimentary canal, since in that thinly inhabited country the wild animals are free to feed without intrusion from man. Nor can it be inferred from the structure of the stomach, that this animal lives on ants or on insects. Animals devoured as food, though of considerable size and solidity, with a proportionally small extent of surface to be acted on by the gastric juice and the action of the stomach, are readily dissolved and digested by animals possessing not a cartilaginous, but a membranaceous stomach; as for instance, a frog in that of a snake.

IN the stomach many minerals are soluble, and the most active things which we can swallow. Calcareous substances are readily acted on. Dr. PRIESTLY has asked, " May not phlogistic matter be the most essential part of the food and support of both vegetable and animal bodies ?" I confess, that Dr. PRIESTLY's finding cause to propose the question, inclines me to suppose that the affirmative to it may be true. Earth seems to be the basis of all animal matter. The growth of the bones must be attended with a constant supply; and in the human species there is a copious discharge of calcareous matter thrown out by the kidneys and salivary glands. May not the quadruped in question derive phlogiston from earth? salt from mineral substances? And, as it is not deprived of the power of drinking water, what else is necessary to the subsistence of his corporeal machine?

CONSIDERING

CONSIDERING the scaly covering of this animal, we may conceive that it may be at least necessary for its existence, on that account, to imbibe a greater proportion of earth than is necessary to other animals. It may deserve consideration, that birds are covered with feathers, which in their constituent principles approach to the nature of horn and bone. Of these animals the gallinaceous tribe swallow stones; and the carnivorous take in the feathers and bones of their prey: the latter article is known to be soluble in the membranaceous stomachs; and hence is a copious supply of the earthy principles. In truth, I do not know that any thing is soluble in the stomach of animals which may not be thence absorbed into their circulating system; and nothing can be so absorbed without affecting the whole constitution.

WHAT I have here stated is all that I could advance to the Colonel; but my opinion has been since not a little confirmed by observing the report of experiments by M. BRUQUATELLI of *Parma*, on the authority of M. CRELL; by which we learn, that some birds have so great a dissolvent power in the gastric juice as to dissolve in their stomachs flints, rock-crystal, calcareous stones, and shells.

I BEG only farther to observe, that some things in BUFFON's description of the Pangolin, not apparently quite applicable to this animal, might have been owing to his description being only from the view of a dried preparation, in which the organs of generation would be obliterated and the dugs shrivelled away so as to be imperceptible, else that elegant philosopher could not have asserted that, "*tous les animaux quadrupèdes, qu'il sont couverts d'écaillés, sont ovipares.*"

Excuse my prolixity, which is only in me the necessary attendant of my superficial knowledge of things. In ingenuoufness, however, I hope that I am not inferior to any man : and I am proud to subscribe myself,

SIR,

Your most obedient humble servant,

ADAM BURT.

GYA, *September 14, 1789.*

A LETTER FROM DOCTOR ANDERSON  
TO SIR WILLIAM JONES.

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DEAR SIR,

THE male *Lac* insect having hitherto escaped the observation of naturalists, I send the enclosed description, made by Mr. WILLIAM ROXBURGH, Surgeon on this establishment, and Botanist to the Honourable Company, in hopes you will give it a place in the publication of your Society, as Mr. ROXBURGH's discovery will bring *Lac* a genus into the class Hemiptera of LINNÆUS.

I am, with esteem,

Dear Sir,

Your very obedient servant,

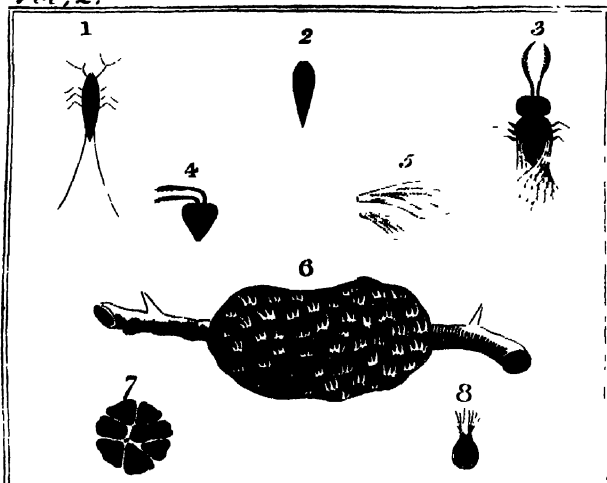
JAMES ANDERSON.

*Fort St. George, January 2, 1790.*









## XXIV.

### ON THE LA'CSHA', OR LAC INSECT\*.

BY MR. W. ROXBURGH.

SOME pieces of very fresh-looking lac, adhering to small branches of *mimosa cinerea*, were brought me from the mountains on the 20th of last month. I kept them carefully; and the day, the 4th of December, fourteen days from the time they came from the hills, myriads of exceedingly minute animals were observed creeping about the lac and branches it adhered to, and more still issuing from small holes over the surface of the cells. Other small and perforated existences were observed with a glass amongst the perforations from which the minute insects issued, regularly two to each hole, and crowned with some very fine white hairs. When the hairs were rubbed off, two white spots appeared. The animals, when single, ran about pretty briskly; but in general they were so numerous as to be crowded over one another. The body is oblong, tapering most towards the tail, below plain, above convex, with a double, or flat margin: laterally on the back part of the thorax are two small tubercles, which may be the eyes: the body behind the thorax is crossed with twelve rings: legs six: feelers (antennæ) half the length of the body, jointed, hairy, each ending in two hairs as long as the antennæ: rump, a white point,

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\* See the Plate, Fig. 1. The female insect in its larva state. 2. The egg, which produces the male. 3. The male insect. 4. The head with jointed antennæ. 5. The wings on one side. The preceding figures are much magnified, but in just proportion. 6. A piece of Lac, of its natural size. 7. The inside of the external coat of the cells. 8. One of the struts. The two last figures are a little magnified.

between two terminal hairs, which are as long as the body of the animal. The mouth I could not see. On opening the cells, the substance that they were formed of cannot be better described, with respect to appearance, than by saying it is like the transparent amber that beads are made of: the external covering of the cells may be about half a line thick, is remarkably strong, and able to resist injuries: the partitions are much thinner: the cells are in general irregular squares, pentagons and hexagons, about an eighth of an inch in diameter, and  $\frac{1}{4}$  deep: they have no communication with each other: all those I opened during the time the animals were issuing, contained in one half a small bag filled with a thick red jelly-like liquor, replete with what I take to be eggs; these bags, or *utriculi*, adhere to the bottom of the cells, and have each two necks, which pass through perforations in the external coat of the cells, forming the fore-mentioned excrescences, and ending in some very fine hairs. The other half of the cells have a distinct opening, and contain a white substance, like some few filaments of cotton rolled together, and numbers of the insects themselves ready to make their exit. Several of the same insects I observed to have drawn up their legs, and to lie flat: they did not move on being touched, nor did they show any signs of life with the greatest irritation.

*December 5.* THE same minute hexapodes continue issuing from their cells in numbers; they are more lively, of a deepened red colour, and fewer of the motionless sort. To-day I saw the mouth: it is a flattened point about the middle of the breast, which the little animal projects on being compressed.

*December 6.* THE male insects I have found to-day: a few of them are constantly running among the females most actively: as yet they are scarce more, I imagine, than one to 5000 females, but twice their size. The  
head

head is obtuse; eyes black, very large; antennæ clavated, feathered, about  $\frac{1}{3}$  the length of the body: below the middle an articulation, such as those in the legs: colour between the eyes a beautiful shining green: neck very short: body oval, brown: abdomen oblong, the length of body and head: legs six: wings membranaceous, four, longer than the body, fixed to the sides of the thorax, narrow at their insertions, growing broader for  $\frac{2}{3}$  of their length, then rounded: the anterior pair is twice the size of the posterior: a strong fibre runs along their anterior margins: they lie flat, like the wings of a common fly, when it walks or rests: no hairs from the rump: it springs most actively to a considerable distance on being touched: mouth in the under part of the head: *maxillæ* transverse. To-day the female insects continue issuing in great numbers, and move about as on the 4th.

December 7. \* THE small red insects still more numerous, and move about as before: winged insects, still very few, continue active. There have been fresh leaves and bits of the branches of both *minosa cinerea* and *corinda* put into the wide-mouthed bottle with them: they walk over them indifferently, without showing any preference, nor inclination to work nor copulate. I opened a cell whence I thought the winged flies had come, and found several, eight or ten, more in it, struggling to shake off their incumbrances: they were in one of those *utriculi* mentioned on the 4th, which ends in two mouths, shut up with fine white hairs, but one of them was open for the exit of the flies; the other would no doubt have opened in due time. This *utriculus* I found now perfectly dry, and divided into cells by exceeding thin partitions. I imagine, before any of the flies made their escape, it might have contained about twenty. In these minute cells with the living flies, or whence they had made their escape, were small dry dark coloured compressed grains; which may be the dried excrements of the flies.

## NOTE BY THE PRESIDENT.

THE *Hindus* have six names for *Lac*; but they generally call it *Lácsà*, from the *multitude* of small insects, who, as they believe, discharge it from their stomachs, and at length destroy the tree on which they form their colonies. A fine *Pippala*, near *Crishnanagar*, is now almost wholly destroyed by them.

## XXV.

### THE SEVENTH ANNIVERSARY DISCOURSE,

DELIVERED 25 FEBRUARY, 1790.

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BY THE PRESIDENT.

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GENTLEMEN,

**A**LTHOUGH we are at this moment considerably nearer to the frontier of *China* than to the farthest limit of the *British* dominions in *Hindustán*, yet the first step that we shall take in the philosophical journey, which I propose for your entertainment at the present meeting, will carry us to the utmost verge of the habitable globe known to the best geographers of old *Greece* and *Egypt*; beyond the boundary of whose knowledge we shall discern from the heights of the northern mountains an empire nearly equal in surface to a square of fifteen degrees; an empire, of which I do not mean to assign the precise limits, but which we may consider, for the purpose of this dissertation, as embraced on two sides by *Tartary* and *India*, while the ocean separates its other sides from various *Asiatic* isles of great importance in the commercial system of *Europe*. Annexed to that immense track of land is the peninsula of *Corea*, which a vast oval bay divides from *Nipon*, or *Japan*, a celebrated and imperial island, bearing in arts and in arms in advantage of situation, but not in felicity of government:—a pre-eminence among eastern kingdoms, analogous to that of *Britain* among the nations of the west. So many climates are included in so prodigious an area, that, while the principal emporium of *China* lies nearly under the tropic, its



metropolis enjoys the temperature of *Samarband*; such too is the diversity of soil in its fifteen provinces, that, while some of them are exquisitely fertile, richly cultivated, and extremely populous, others are barren and rocky, dry and unfruitful, with plains as wild or mountains as rugged as any in *Scythia*, and those either wholly deserted, or peopled by savage hordes, who, if they be not still independent, have been very lately subdued by the perfidy, rather than the valour, of a monarch, who has perpetuated his own breach of faith in a *Chingse* poem, of which I have seen a translation.

THE word *China*, concerning which I shall offer some new remarks, is well known to the people whom we call the *Chingse*; but they never apply it (I speak of the learned among them) to themselves or to their country. Themselves, according to Father VISDELOU, they describe as the *people of HAN*, or of some other illustrious family, by the memory of whose actions they flatter their national pride; and their country they call *Chim-cü*, or the *Central Kingdom*, representing it in their symbolical characters by a parallelogram exactly bisected; at other times they distinguish it by the words *Tien-hua*, or *What is under Heaven*, meaning *all that is valuable on earth*. Since they never name themselves with moderation, they would have no right to complain, if they knew that *European* authors have ever spoken of them in the extremes of applause or of censure. By some they have been extolled as the oldest and the wisest, as the most learned and most ingenious of nations; whilst others have derided their pretensions to antiquity, condemned their government as abominable, and arraigned their manners as inhuman, without allowing them an element of science, or a single art, for which they have not been indebted to some more ancient and more civilized race of men. The truth perhaps lies, where we usually find it, between the extremes; but it is not my design to accuse or to defend

the *Chinese*, to depress or to aggrandize them : I shall confine myself to the discussion of a question connected with my former discourses, and far less easy to be solved than any hitherto stated. “ Whence came the singular people who long had governed *China* before they were conquered “ by the *Tartars* ?” On this problem, the solution of which has no concern, indeed, with our political or commercial interests, but a very material connection, if I mistake not, with interests of a higher nature, four opinions have been advanced ; and all rather peremptorily asserted than supported by argument and evidence. By a few writers it has been urged, that the *Chinese* are an original race, who have dwelt for ages, if not from eternity, in the land which they now possess : by others, and chiefly by the missionaries, it is insisted that they sprang from the same stock with the *Hebrews* and *Arabs* : a third assertion is that of the *Arabs* themselves, and of M. PAUW, who hold it indubitable that they were originally *Tartars*, descending in wild clans from the steeps of *Imaus* : and a fourth, at least as dogmatically pronounced as any of the preceding, is that of the *Bráhmens*, who decide, without allowing any appeal from their decision, that the *Chinas* (for so they are named in *Sanscrit*) were *Hindus* of the *Cshatriya*, or military class, who, abandoning the privileges of their tribe, rambled in different bodies to the north-east of *Bengal* ; and forgetting by degrees the rites and religion of their ancestors, established separate principalities, which were afterwards united in the plains and valleys which are now possessed by them. If any one of the three last opinions be just, the first of them must necessarily be relinquished ; but of those three, the first cannot possibly be sustained ; because it rests on no firmer support than a foolish remark, whether true or false, that *Sem* in *Chinese* means *life* and *procreation* ; and because a tea-plant is not more different from a palm than a *Chinese* from an *Arab*. They are men, indeed, as  
the

the tea and the palm are vegetables ; but human sagacity could not, I believe, discover any other trace of resemblance between them. One of the *Arabs*, indeed, an account of whose voyage to *India* and *China* has been translated by RENAUDOT, thought the *Chinefe* not only handsomer (according to his ideas of beauty) than the *Hindus*, but even more like his own countrymen in features, habiliments, carriage, manners, and ceremonies ; and this may be true, without proving an actual resemblance between the *Chinefe* and *Arabs*, except in dress and complexion. The next opinion is more connected with that of the *Bráhmens* than M. PAUW probably imagined ; for though he tells us expressly, that by *Scythians* he meant the *Turks* or *Tartars* ; yet the dragon on the standard, and some other peculiarities, from which he would infer a clear affinity between the old *Tartars* and the *Chinefe*, belonged indubitably to those *Scythians* who are known to have been *Goths* ; and the *Goths* had manifestly a common lineage with the *Hindus*, if his own argument, in the preface to his *Researches on the Similarity of Language* be, as all men agree that it is, irrefragable. That the *Chinefe* were anciently of a *Tartarian* stock, is a proposition which I cannot otherwise disprove for the present, than by insisting on the total dissimilarity of the two races in manners and arts, particularly in the fine arts of imagination, which the *Tartars*, by their own account, never cultivated ; but, if we show strong grounds for believing that the first *Chinefe* were actually of an *Indian* race, it will follow that M. PAUW and the *Arabs* are mistaken. It is to the discussion of this new and, in my opinion, very interesting point, that I shall confine the remainder of my discourse.

IN the *Sanscrit* Institutes of Civil and Religious Duties, revealed, as the *Hindus* believe, by MENU, the son of BRAHMA', we find the following curious passage : " Many families of the military class, having gradually  
 " abandoned

“ abandoned the ordinances of the *Vēda* and the company of *Brāhmins*,  
 “ lived in a state of degradation; as the people of *Pundraca* and *Odra*,  
 “ those of *Dravira* and *Cambija*, the *Yavanas* and *Sacas*, the *Pāradas* and  
 “ *Pahlavas*, the *Chinas*, and some other nations.” A full comment on this  
 text would here be superfluous; but, since the testimony of the *Indian* author,  
 who, though certainly not a divine personage, was as certainly a very ancient  
 lawyer, moralist, and historian, is direct and positive, disinterested and un-  
 suspected, it would, I think, decide the question before us, if we could be  
 sure that the word *China* signified a *Chinese*, as all the *Pandits*, whom I  
 have separately consulted, assert with one voice. They assure me, that the  
*Chinas* of *MENU* settled in a fine country to the north-east of *Gaur*, and to  
 the east of *Camarūp* and *Népāl*; that they have long been and still are  
 famed as ingenious artificers; and that they had themselves seen old *Chinese*  
 idols, which bore a manifest relation to the primitive religion of *India* be-  
 fore *BUDDHA*’s appearance in it. A well-informed *Pandit* showed me a  
*Sanscrit* book in *Cashmirian* letters, which, he said, was revealed by *SIVA*  
 himself, and entitled *Satīśangama*. He read to me a whole chapter of it on  
 the heterodox opinions of the *Chinas*, who were divided, says the author,  
 into near two hundred clans. I then laid before him a map of *Asia*; and,  
 when I pointed to *Cashmīr*, his own country, he instantly placed his finger  
 on the north-western provinces of *China*, where the *Chinas*, he said, first  
 established themselves; but he added, that *Mahāchina*, which was also men-  
 tioned in his book, extended to the eastern and southern oceans. I believe,  
 nevertheless, that the *Chinese* empire, as we now call it, was not formed  
 when the laws of *MENU* were collected; and for this belief, so repugnant  
 to the general opinion, I am bound to offer my reasons. If the outline of  
 history and chronology for the last two thousand years be correctly traced  
 (and we must be hardy sceptics to doubt it) the poems of *CA’LIDA*’s were  
 composed

composed before the beginning of our era. Now it is clear, from internal and external evidence, that the *Rámdyan* and *Mahábhárat* were considerably older than the productions of that poet; and it appears, from the style and metre of the *Dherma Sástra*, revealed by MENV, that it was reduced to writing long before the age of VA'LMIC or VYA'SA, the second of whom names it with applause. We shall not therefore be thought extravagant, if we place the compiler of those laws between a thousand and fifteen hundred years before CHRIST; especially as BUDDHA, whose age is pretty well ascertained, is not mentioned in them; but in the twelfth century before our era, the *Chinese* empire was at least in its cradle. This fact it is necessary to prove; and my first witness is CONFUCIUS himself. I know to what keen satire I shall expose myself by citing that philosopher, after the bitter sarcasms of M. PAUW against him and against the translators of his mutilated but valuable works; yet I quote without scruple the book entitled *Lín Yú*, of which I possess the original, with a verbal translation, and which I know to be sufficiently authentic for my present purpose. In the second part of it CON-FU-TSU declares, that "Although he, like other men, could relate, as mere lessons of "morality, the histories of the first and second imperial houses, yet, for "want of evidence, he could give no certain account of them." Now, if the *Chinese* themselves do not even pretend that any historical monument existed in the age of CONFUCIUS preceding the rise of their third dynasty, about eleven hundred years before the *Christian* epoch, we may justly conclude, that the reign of VU'VAM was in the infancy of their empire, which has ~~only~~ grew to maturity till some ages after that prince; and it has been asserted by very learned *Europeans*, that even of the third dynasty, which he has the fame of having raised, no unsuspected memorial can now be produced. It was not till the eighth century before the birth of our Saviour,

Saviour, that a small kingdom was erected in the province of *Shen-si*, the capital of which stood nearly in the *thirty-fifth* degree of northern latitude, and about *five* degrees to the west of *Si-gan*: both the country and its metropolis were called *Chin*; and the dominion of its princes was gradually extended to the east and west. A king of *Chin*, who makes a figure in the *Shâhnámah* among the allies of *AFRA'SIYA'B*, was, I presume, a sovereign of the country just mentioned; and the river of *Chin*, which the poet frequently names as the limit of his eastern geography, seems to have been the *Yellow River*, which the *Chinese* introduce at the beginning of their fabulous annals. I should be tempted to expatiate on so curious a subject; but the present occasion allows nothing superfluous, and permits me only to add, that *Mangukhân* died in the middle of the thirteenth century, before the city of *Chin*, which was afterwards taken by *KUBLAI*, and that the poets of *Irân* perpetually allude to the districts around it, which they celebrate, with *Chegil* and *Khoten*, for a number of musk-animals roving on their hills. The territory of *Chin*, so called by the old *Hindus*, by the *Persians*, and by the *Chinese* (while the *Greeks* and *Arabs* were obliged by their defective articulation to miscall it *Sin*) gave its name to a race of emperors, whose tyranny made their memory so unpopular, that the modern inhabitants of *China* hold the word in abhorrence, and speak of themselves as the people of a milder and more virtuous dynasty; but it is highly probable that the whole nation descended from the *Chinas* of *MENU*, and, mixing with the *Tartars*, by whom the plains of *Honan* and the more southern provinces were thinly inhabited, formed by degrees the race of men whom we now see in possession of the noblest empire in *Asia*.

In support of an opinion which I offer as the result of long and anxious inquiries, I should regularly proceed to examine the language and letters,

religion and philosophy, of the present *Chinefe*, and subjoin some remarks on their ancient monuments, on their sciences, and on their arts, both liberal and mechanical; but their spoken *language*, not having been preserved by the usual symbols of articulate sounds, must have been for many ages in a continual flux; their *letters*, if we may so call them, are merely the symbols of ideas; their popular *religion* was imported from *India* in an age comparatively modern; and their *philosophy* seems yet in so rude a state, as hardly to deserve the <sup>\*</sup>appellation; they have no *ancient monuments* from which their origin can be traced even by plausible conjecture; their *sciences* are wholly exotic; and their *mechanical arts* have nothing in them characteristic of a particular family; nothing which any set of men in a country so highly favoured by nature, might not have discovered and improved. They have indeed, both national music and national poetry, and both of them beautifully pathetic; but of painting, sculpture, or architecture, as arts of imagination, they seem (like other *Asiatics*) to have no idea. Instead therefore of enlarging separately on each of those heads, I shall briefly inquire, how far the literature and religious practices of *China* confirm or oppose the proposition which I have advanced.

THE declared and fixed opinion of M. DE GUIGNES on the subject before us, is nearly connected with that of the *Bráhmens*: he maintains, that the *Chinefe* were emigrants from *Egypt*; and the *Egyptians*, or *Ethiopians*, (for they were clearly the same people) had indubitably a common origin with the old natives of *India*, as the affinity of their languages, and of their institutions, both religious and political, fully evinces; but that *China* was peopled a few centuries before our era by a colony from the *Banks of the Nile*, though neither *Persians* nor *Arabs*, *Tartars* nor *Hindus*, ever heard of such an emigration, is a paradox, which the bare authority even of so learned

a man cannot support ; and, since reason grounded on fact can alone decide such a question, we have a right to demand clearer evidence and stronger arguments than any he has adduced. The hieroglyphics of *Egypt* bear, indeed, a strong resemblance to the mythological sculptures and paintings of *India*, but seem wholly dissimilar to the symbolical system of the *Chinese*, which might easily have been invented (as they assert) by an individual, and might very naturally have been contrived by the first *Chinas*, or out-cast *Hindus*, who either never knew, or had forgotten, the alphabetical characters of their wiser ancestors. As to the table and bust of *ISIS*, they seem to be given up as modern forgeries ; but, if they were indisputably genuine, they would be nothing to the purpose ; for the letters on the bust appear to have been designed as alphabetical ; and the fabricator of them (if they really were fabricated in *Europe*) was uncommonly happy, since two or three of them are exactly the same with those on a metal pillar yet standing in the north of *India*. In *Egypt*, if we can rely on the testimony of the *Greeks*, who studied no language but their own, there were two sets of alphabetical characters ; the one *popular*, like the various letters used in our *Indian* provinces ; and the other *sacerdotal*, like the *Dévanâgarî*, especially that form of it which we see in the *Vêda* ; besides which they had two sorts of  *sacred sculpture* ; the one simple, like the figures of *BUDDHA* and the three *RA'MAS* ; and the other allegorical, like the images of *GANE'SA*, or *Divine Wisdom*, and *ISA'NI'*, or *Nature*, with all their emblematical accompaniments ; but the *real character* of the *Chinese* appears wholly distinct from any *Egyptian* writing, either mysterious or popular ; and, as to the fancy of *M. DE GUIGNES*, that the complicated symbols of *China* were at first no more than *Phœnician* monograms, let us hope that he has abandoned so wild a conceit, which he started probably with no other view than to display his ingenuity and learning.



WE have ocular proof that the few radical characters of the *Chinese* were originally (like our astronomical and chymical symbols) the pictures or outlines of visible objects, or figurative signs for simple ideas, which they have multiplied by the most ingenious combinations and the liveliest metaphors; but as the system is peculiar, I believe, to themselves and the *Japanese*, it would be idly ostentatious to enlarge on it at present; and, for the reasons already intimated, it neither corroborates nor weakens the opinion which I endeavour to support. The same may as truly be said of their *spoken* language; for, independently of its constant fluctuation during a series of ages, it has the peculiarity of excluding four or five sounds; which other nations articulate, and is clipped into monosyllables, even when the ideas expressed by them, and the written symbols for those ideas, are very complex. This has arisen, I suppose, from the singular habits of the people; for though their common tongue be so *musically* accented as to form a kind of recitative, yet it wants those *grammatical* accents, without which all human languages would appear monosyllabic: thus *Amīta*, with an accent on the first syllable, means, in the *Sanscrit* language, *immeasurable*; and the natives of *Bengal* pronounce it *Omīto*; but, when the religion of BUDDHA, the son of MA'YA', was carried hence into *China*, the people of that country, unable to renounce the name of their new God, called him FOE, the son of MO-YE, and divided his epithet *Amīta* into three syllables: O-MI-TO annexing to them certain ideas of their own, and expressing them in writing by three distinct symbols. We may judge from this instance, whether a comparison of their spoken tongue with the dialects of other nations can lead to any certain conclusion as to their origin; yet the instance which I have given, supplies me with an argument from analogy, which I produce as conjectural only, but which appears more and more plausible the oftener I consider it. The

BUDDHA of the *Hindus* is unquestionably the Foe of *China*; but the great progenitor of the *Chinese* is also named by them FO-HI, where the second monosyllable signifies, it seems, a *victim*. Now the ancestor of that military tribe whom the *Hindus* call the *Chandravanša*, or Children of the MOON, was, according to their *Purānas* or legends, BUDDHA, or the genius of the planet *Mercury*, from whom, in the *fifth* degree, descended a prince named DRUHYA; whom his father YAYA'TI sent in exile to the east of *Hindustān*, with this imprecation, "May thy progeny be ignorant of the *Vēda*." The name of the banished prince could not be pronounced by the modern *Chinese*; and, though I dare not conjecture that the last syllable of it has been changed into YAO, I may, nevertheless, observe that YAO was the *fifth* in descent from FO-HI, or at least the fifth mortal in the first imperial dynasty; that all *Chinese* history before him is considered by *Chinese* themselves as poetical or fabulous; that his father TI-CO, like the *Indian* king YAYA'TI, was the first prince who married several women; and that FO-HI, the head of their race, appeared, say the *Chinese*, in a province of the west, and held his court in the territory of *Chin*, where the rovers, mentioned by the *Indian* legislator, are supposed to have settled. Another circumstance in the parallel is very remarkable:—According to FATHER DE PREMARE, in his tract on *Chinese* mythology, the mother of FO-HI was the *Daughter of Heaven*, surnamed *Flower-loving*; and, as the nymph was walking alone on the bank of a river with a similar name, she found herself on a sudden encircled by a rainbow; soon after which she became pregnant, and at the end of twelve years was delivered of a son radiant as herself, who, among other titles, had that of SU'I, or *Star of the Year*. Now, in the mythological system of the *Hindus*, the nymph RO'HINI, who presides over the fourth lunar mansion, was the favourite mistress of SO'MA, or the Moon; among whose numerous epithets

we find *Cumudandyaca*, or *Delighting in a species of water-flower* that blooms at night; and their offspring was BUDHA, regent of a planet, and called also, from the names of his parents, RAUHINE'YA, or SAUMYA. It is true that the learned missionary explains the word SU, by *Jupiter*; but an exact resemblance between two such fables could not have been expected; and it is sufficient for my purpose that they seem to have a family likeness. The God BUDHA, say the *Indians*, married ILA', whose father was preserved in a miraculous ark from an universal deluge. Now, although I cannot insist with confidence, that the *rainbow* in the *Chinese* fable alludes to the *Mosaic* narrative of the flood, nor build any solid argument on the divine personage NIU-VA, of whose character, and even of whose sex, the historians of *China* speak very doubtfully, I may, nevertheless, assure you, after full inquiry and consideration, that the *Chinese*, like the *Hindus*, believe this earth to have been wholly covered with water, which, in works of undisputed authenticity, they describe as *flowing abundantly, then subsiding, and separating the higher from the lower age of mankind*; that the *division of time*, from which their poetical history begins, just preceded the appearance of FO-HI on the mountains of *Chin*, but that the great *inundation* in the reign of YAO was either confined to the lowlands of his kingdom, if the whole account of it be not a fable, or, if it contain any allusion to the flood of NOAH, has been ignorantly misplaced by the *Chinese* annalists.

THE importation of a new religion into *China* in the first century of our era, must lead us to suppose that the former system, whatever it was, had been found inadequate to the purpose of restraining the great body of the people from those offences against conscience and virtue, which the civil power could not reach; and it is hardly possible that, without such restrictions, any government could long have subsisted with felicity; for no  
govern-

government can long subsist without equal justice, and justice cannot be administered without the sanctions of religion. Of the religious opinions entertained by CONFUCIUS, and his followers, we may glean a general notion from the fragments of their works translated by COUPLET: they professed a firm belief in the supreme GOD, and gave a demonstration of his being and of his providence from the exquisite beauty and perfection of the celestial bodies, and the wonderful order of nature in the whole fabric of the visible world. From this belief they deduced a system of ethics, which the philosopher sums up in a few words at the close of the *Lún-yü*: “He,” says CONFUCIUS, “who shall be fully persuaded that the Lord of Heaven governs the universe, who shall in all things chuse moderation, who shall perfectly know his own species, and so act among them that his life and manners may conform to his knowledge of GOD and man, may be truly said to discharge all the duties of a sage, and to be far exalted above the common herd of the human race.” But such a religion and such morality could never have been general; and we find that the people of *China* had an ancient system of ceremonies and superstitions, which the government and the philosophers appear to have encouraged, and which had an apparent affinity with some parts of the oldest *Indian* worship. They believed in the agency of genii, or tutelary spirits, presiding over the stars and the clouds, over lakes and rivers, mountains, valleys, and woods, over certain regions and towns, over all the elements (of which, like the *Hindus*, they reckoned five) and particularly over fire, the most brilliant of them: to those deities they offered victims on high places; and the following passage from the *Shi-cin*, or *Book of Odes*, is very much in the style of the *Bráhmans*: “Even they who perform a sacrifice with due reverence, cannot perfectly assure themselves that the divine spirits accept their oblations; and far less can they who adore the Gods with languor and ositancy, clearly perceive their sacred il-  
“ lapses.”

“ lapses.” These are imperfect traces indeed, but they are traces of an affinity between the religion of *MENU* and that of the *Chinas*, whom he names among the apostates from it. *M. LE GENTIL* observed, he says, a strong resemblance between the funeral rites of the *Chinefe* and the *Sráddha* of the *Hindus*; and *M. BAILLY*, after a learned investigation, concludes, that “ Even the puerile and absurd stories of the *Chinefe* fabulists contain a remnant of ancient *Indian* history, with a faint sketch of the first *Hindu* ages.” As the *Bauddhas*, indeed, were *Hindus*, it may naturally be imagined that they carried into *China* many ceremonies practised in their own country; but the *Bauddhas* positively forbade the immolation of ~~o~~me; yet we know that various animals, even bulls and men, were anciently sacrificed by the *Chinefe*; besides which we discover many singular marks of relation between them and the old *Hindus*;—as in the remarkable period of *four hundred and thirty-two thousand*, and the cycle of *sixty*, years; in the predilection for the mystical number *nine*; in many similar fasts and great festivals, especially at the solstices and equinoxes; in the just-mentioned obsequies consisting of rice and fruits offered to the manes of their ancestors; in the dread of dying childless, lest such offerings should be intermitted; and, perhaps, in their common abhorrence of *red* objects, which the *Indians* carried so far, that *MENU* himself, where he allows a *Bráhmén* to trade, if he cannot otherwise support life, absolutely forbids “ his trafficking in any sort of *red* cloths, “ whether linen or woollen, or made of woven bark.” All the circumstances, which have been mentioned under the two heads of *literature* and *religion*, seem collectively to prove (as far as such a question admits proof) that the *Chinefe* and *Hindus* were originally the same people; but having been separated near four thousand years, have retained few strong features of their ancient consanguinity, especially as the *Hindus* have preserved their old language and ritual, while the *Chinefe* very soon lost both; and the *Hindus*  
have

have constantly intermarried among themselves, while the *Chinese*, by a mixture of *Tartarian* blood from the time of their first establishment, have at length formed a race distinct in appearance both from *Indians* and *Tartars*.

A SIMILAR diversity has arisen, I believe, from similar causes, between the people of *China* and *Japan*; on the second of which nations we have now, or soon shall have, as correct and as ample instruction as can possibly be obtained without a perfect acquaintance with the *Chinese* characters. KÆMPFER has taken from M. TITSINGH the honour of being the first, and he from KÆMPFER that of being the only, *European* who, by a long residence in *Japan*, and a familiar intercourse with the principal natives of it, has been able to collect authentic materials for the natural and civil history of a country *secluded*, as the *Romans* used to say of our own island, *from the rest of the world*. The works of these illustrious travellers will confirm and embellish each other; and when M. TITSINGH shall have acquired a knowledge of *Chinese*, to which a part of his leisure in *Java* will be devoted, his precious collection of books in that language, on the laws and revolutions, the natural productions, the arts, manufactures, and sciences of *Japan*, will be in his hands an inexhaustible mine of new and important information. Both he and his predecessor assert with confidence, and, I doubt not, with truth, that the *Japanese* would resent, as an insult on their dignity, the bare suggestion of their descent from the *Chinese*, whom they surpass in several of the mechanical arts, and, what is of greater consequence, in military spirit; but they do not, I understand, mean to deny that they are a branch of the same ancient stem with the people of *China*; and, were that fact ever so warmly contested by them, it might be proved by an invincible argument, if the preceding part of this discourse, on the Origin of the *Chinese*, be thought to contain just reasoning. In the

first place, it seems inconceivable that the *Japanese*, who never appear to have been conquerors or conquered, should have adopted the whole system of *Chinese* literature with all its inconveniences and intricacies, if an immemorial connexion had not subsisted between the two nations, or, in other words, if the bold and ingenious race who peopled *Japan* in the middle of the thirteenth century before CHRIST, and, about six hundred years afterwards, established their monarchy, had not carried with them the letters and learning which they and the *Chinese* had possessed in common; but my principal argument is, that the *Hindu* or *Egyptian* idolatry has prevailed in *Japan* from the earliest ages; and among the idols worshipped, according to KÆMPFER, in that country before the innovations of SA'CŸA or BUDDHA (whom the *Japanese* also call AMIDA) we find many of those which we see every day in the temples of *Bengal*; particularly the goddesses with many arms, representing the powers of Nature (in *Egypt* named ISIS, and here ISA'NI', or ISI') whose image, as it is exhibited by the *German* traveller, all the *Bráhmans*, to whom I showed it, immediately recognized with a mixture of pleasure and enthusiasm. It is very true that the *Chinese* differ widely from the natives of *Japan* in their vernacular dialects, in external manners, and perhaps in the strength of their mental faculties; but as wide a difference is observable among all the nations of the *Gothic* family; and we might account even for a greater dissimilarity, by considering the number of ages during which the several swarms have been separated from the great *Indian* hive, to which they primarily belonged. The modern *Japanese* gave KÆMPFER the idea of polished *Tartars*; and it is reasonable to believe that the people of *Japan*, who were originally *Hindus* of the martial class and advanced farther eastward than the *Chinas*, have, like them, insensibly changed their features and characters by intermarriages with various *Tartarian* tribes, whom they found loosely scattered over their isles, or who afterwards fixed their abode in them.

HAVING now shown in five discourses that the *Arabs* and *Tartars* were originally distinct races, while the *Hindus*, *Chinese*, and *Japanese* proceeded from another ancient stem, and that all the three stems may be traced to *Iran* as to a common centre, from which it is highly probable that they diverged in various directions about four thousand years ago, I may seem to have accomplished my design of investigating the origin of the *Asiatic* nations; but the questions which I undertook to discuss are not yet ripe for a strict analytical argument; and it will first be necessary to examine with scrupulous attention all the detached or insulated races of men who either inhabit the borders of *India*, *Arabia*, *Tartary*, *Persia*, and *China*, or are interpersed in the mountainous and uncultivated parts of those extensive regions. To this examination I shall, at our next annual meeting, allot an entire discourse; and if, after all our inquiries, no more than *three* primitive races can be found, it will be a subsequent consideration, whether those three stocks had one common root; and if they had, by what means that root was preserved amid the violent shock which our whole globe appears evidently to have sustained.





## XXVI.

THE TRANSLATION OF AN INSCRIPTION  
IN THE MAGA LANGUAGE,  
ENGRAVED ON A SILVER PLATE, FOUND IN A CAVE  
NEAR ISLA'MABA'D.

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COMMUNICATED BY JOHN SHORE, ESQ.

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ON the 14th of *Mágha* 904, *Chánda Láh Rájá*\*, by the advice of *Bowangari Rauli*, who was the director of his studies and devotions, and in conformity to the sentiments of twenty-eight other *Raulis*, formed the design of establishing a place of religious worship; for which purpose a cave was dug, and paved with bricks, three cubits in depth, and three cubits also in diameter, in which there were deposited one hundred and twenty brazen images of small dimensions, denominated *Tahmúdas*; also twenty brazen images larger than the former, denominated *Lángúda*; there was likewise a large image of stone, called *Lángúdagári*, with a vessel of brass, in which were deposited two of the bones of *T'hácur*: on a silver plate were inscribed the *Hauca*, or the mandates of the Deity; with that also styled *Taumah Chuckfowna Tahma*, to the study of which twenty-eight *Raulis* devote their time and attention; who, having celebrated the present work of devotion with festivals and rejoicings, erected over the cave a place of religious worship for the *Magas*, in honour of the Deity.

GOD sent into the world BUDDHA AVATA'R to instruct and direct the steps of angels and of men; of whose birth and origin the following is a relation: When BUDDHA AVATA'R descended from the region of souls in the

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\* Perhaps, *Sándilyah*.

month of *Māgh*, and entered the body of MAHA'MA'YA', the wife of SOOTAH DANNAH, *Rāja* of *Cailās*, her womb suddenly assumed the appearance of clear transparent crystal, in which BUDDHA appeared, beautiful as a flower, kneeling and reclining on his hands. After ten months and ten days of her pregnancy had elapsed, MAHA'MA'YA' solicited permission from her husband the *Rāja* to visit her father; in conformity to which the roads were directed to be repaired and made clear for her journey; fruit-trees were planted, water-vessels placed on the road-side, and great illuminations prepared for the occasion. MAHA'MA'YA' then commenced her journey, and arrived at a garden adjoining to the road, where inclination led her to walk and gather flowers. At this time, being suddenly attacked with the pains of child-birth, she laid hold on the trees for support, which declined their boughs at the instant, for the purpose of concealing her person while she was delivered of the child; at which juncture BRAHMA' himself attended, with a golden vessel in his hand, on which he laid the child, and delivered it to INDRA, by whom it was committed to the charge of a female attendant; upon which the child, alighting from her arms, walked seven paces, whence it was taken up by MAHA'MA'YA' and carried to her house; and, on the ensuing morning, news were circulated of a child being born in the *Rāja's* family. At this time TAPASWI *Muni*, who, residing in the woods, devoted his time to the worship of the Deity, learned by inspiration that BUDDHA was come to life in the *Rāja's* palace: he flew through the air to the *Rāja's* residence, where, sitting on a throne, he said, "I have repaired hither for the purpose of visiting the child." BUDDHA was accordingly brought into his presence. The *Muni* observed two feet fixed on his head, and, divining something both of good and bad import, began to weep and to laugh alternately. The *Rāja* then questioned him with regard to his present impulse: to whom he answered, "I must not reside in the same place  
 " with

“ with BUDDHA when he shall arrive at the rank of AVATĀR : this is the  
 “ cause of my present affliction ; but I am even now affected with gladness  
 “ by his presence, as I am hereby absolved from all my transgressions.” The  
*Muni* then departed ; and, after five days had elapsed, he assembled four  
*Pandits* for the purpose of calculating the destiny of the child ; three of whom  
 divined that, as he had marks on his hands resembling a wheel, he would  
 at length become a *Rājā Chacraverti* ; another divined that he would arrive  
 at the dignity of *Avatār*.

THE boy was now named SA'CYA, and had attained the age of sixteen  
 years ; at which period it happened that the *Rājā CHUHIDA'N* had a  
 daughter named VASUTA'RA', whom he had engaged not to give in marriage  
 to any one, till such time as a suitor should be found who could brace  
 a certain bow in his possession, which hitherto many *Rājās* had attempted to  
 accomplish without effect. SA'CYA now succeeded in the attempt, and accordingly  
 obtained the *Rājā's* daughter in marriage, with whom he repaired  
 to his own place of residence.

ONE day, as certain mysteries were revealed to him, he formed the design  
 of relinquishing his dominion ; at which time a son was born in his house,  
 whose name was RAGHU. SA'CYA then left his palace with only one at-  
 tendant and a horse, and, having crossed the river GANGĀ', arrived at *Balucāli*,  
 where, having directed his servant to leave him and carry away his horse, he  
 laid aside his armour.

WHEN the world was created there appeared five flowers, which  
 BRAHMA' deposited in a place of safety : three of them were afterwards  
 delivered to the three *T'haris* ; and one was presented to SA'CYA, who  
 discovered

discovered that it contained some pieces of wearing apparel, in which he clothed himself, and adopted the manners and life of a mendicant. A traveller one day passed by him with eight bundles of grafs on his shoulders, and addrest him, saying, “ a long period of time has elapsed, since I “ have seen the *T’hâcur* ; but now since I have the happiness to meet him, “ I beg to present him an offering, consisting of these bundles of grafs.” SA’CYA accordingly accepted of the grafs, and reposed on it. At that time there suddenly appeared a golden temple, containing a chair of wrought gold, and the height of the temple was thirty cubits, upon which BRAHMA’ alighted, and held a canopy over the head of SA’CYA : at the same time INDRA descended, with a large fan in his hand ; and NA’GA, the *Râjâ* of serpents, with shoes in his hand, together with the four tutelar deities of the four corners of the universe ; who all attended to do him service and reverence. At this time likewise the chief of *Afurs* with his forces arrived, riding on an elephant, to give battle to SA’CYA ; upon which BRAHMA’, INDRA, and the other deities deserted him and vanished. SA’CYA, observing that he was left alone, invoked the assistance of the earth ; who, attending at his summons, brought an inundation over all the ground, whereby the *Afur* and his forces were vanquished, and compelled to retire.

AT this time five holy scriptures descended from above, and SA’CYA was dignified with the title of *Buddha Avalâr*. The scriptures confer powers of knowledge and retrospection, the ability of accomplishing the impulses of the heart, and of carrying into effect the words of the mouth. SA’CYA resided here, without breaking his fast, twenty-one days, and then returned to his own country, where he presides over *Râjâs*, governing them with care and equity.

WHOEVER reads the *Cáric*, his body, apparel, and the place of his devotions must be purified; he shall be thereby delivered from the evil machinations of demons and of his enemies; and the ways of redemption shall be open to him. BUDDHA *Avatâr* instructed a certain *Rauli*, by name ANGULI MA'LA, in the writings of the *Cáric*, saying, " whoever shall read " and study them, his soul shall not undergo a transmigration:" and the scriptures were thence called *Anguli Málà*. There were likewise five other books of the *Cáric* denominated *Vachanam*, which, if any one peruse, he shall thereby be exempted from poverty and the machinations of his enemies; he shall also be exalted to dignity and honours, and the length of his days shall be protracted: the study of the *Cáric* heals afflictions and pains of the body; and whoever shall have faith therein, Heaven and bliss shall be the reward of his piety.



## XXVII.

### A SUPPLEMENT TO THE ESSAY ON INDIAN CHRONOLOGY.

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BY THE PRESIDENT.

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OUR ingenious associate Mr. SAMUEL DAVIS, whom I name with respect and applause, and who will soon, I trust, convince M. BAILLY that it is very possible for an *European* to translate and explain the *Sûrya Siddhânta*, favoured me lately with a copy, taken by his *Pandit*, of the original passage, mentioned in his paper on the Astronomical Computations of the *Hindus*, concerning the places of the colures in the time of VARA'HA, compared with their position in the age of a certain *Muni*, or ancient *Indian* philosopher; and the passage appears to afford evidence of two actual observations, which will ascertain the chronology of the *Hindus*, if not by rigorous demonstration, at least by a near approach to it.

THE copy of the *Vârâhîsanhitâ*, from which the three pages, received by me, had been transcribed, is unhappily so incorrect (if the transcript itself was not hastily made) that every line of it must be disfigured by some gross error; and my *Pandit*, who examined the passage carefully at his own house, gave it up as inexplicable; so that, if I had not studied the system of *Sanscrit* prosody, I should have laid it aside in despair; but though it was written as prose, without any sort of distinction or punctuation, yet, when I read it aloud, my ear caught in some sentences the cadence of verse, and of a particular metre, called *Aryâ*, which is regulated (not by the number of syllables, like other *Indian* measures, but) by the proportion of times, or



*syllabic moments*, in the four divisions of which every stanza consists. By numbering those moments and fixing their proportion, I was enabled to restore the text of VARA'HA, with the perfect assent of the learned *Brâhmen* who attends me; and with his assistance I also corrected the comment, written by BHATTO'TPALA, who, it seems, was a son of the author, together with three curious passages which are cited in it. Another *Pandit* afterwards brought me a copy of the whole original work, which confirmed my conjectural emendations, except in two immaterial syllables, and except that the first of the six couplets in the text is quoted in the commentary from a different work, entitled *Panchasiddhânticâ*. Five of them were composed by VARA'HA himself; and the third chapter of his treatise begins with them.

BEFORE I produce the original verses, it may be useful to give you an idea of the *Āryā* measure; which will appear more distinctly in *Latin* than in any modern language of *Europe* :

Tigridas, apros, thoas, tyrannos, pessima monstra, vēnemur :  
Dic hinnulus, dic lepus male quid egerint graminivori.

The couplet might be so arranged as to begin and end with the cadence of a hexameter and pentameter, six *moments* being interposed in the middle of the long, and seven in that of the short hemistich :

Thoas, apros, tigridas nos venemur, pejoresque tyrannos :  
Dic tibi cerva, lepus tibi dic male quid egerit herbivorus.

Since the *Āryā* measure, however, may be almost infinitely varied, the couplet would have a form completely *Roman*, if the proportion of *syllabic in-*

*stants,*

*flants*, in the long and short verses, were *twenty-four* to *twenty*, instead of *thirty* to *twenty-seven* :

Venor apros tigridasque, et, pessima monstra, tyrannos :  
Cerva mali quid agunt herbivorosque lepus ?

I NOW exhibit the five stanzas of VARA'HA in *European* characters, with an etching of the two first, which are the most important, in the original *Devanagari* :

As'léshárdhádácshinamuttaramayanán ravérdhanish't'hádyan  
Núnan cadáchidásidyénóctan púrva sástréshu.  
Sámpratamayanan savituh carca'tacádyan mrigáditas'chanyat :  
Uctábhávè vicritih pratyacshapericshanaír vyaçtíh.  
Dúraft'hachihnavédyádudayé'stamayé'pivà sahafránlòh,  
Ch'háyápravés'anirgamachihnairvà mandalè mahati.  
Aprápya macaramarcò vinivrittò hanti sáparán yámyán,  
Carca'tacamañanpráptò vinivrittás'chóttarán saindrín.  
Uttaramayanamatítýa vyávríttah cshémasáfyá vridhdicarah,  
Pracritist'has'chápyévan vicritigatir bhayacridushnás'uh.

OF the five couplets thus exhibited, the following translation is most scrupulously literal :

“ CERTAINLY the southern solstice was once in the middle of *As'léshu*,  
“ the northern in the first *degree* of *Dhanishi'hà*, by what is recorded in for-  
“ mer *Sástras*. At present one solstice is in the first *degree* of *Carcata*, and  
“ the other in the first of *Macara* : that which is recorded not appearing,  
“ a change

“ a change *must have happened*; and the proof arises from ocular demon-  
 “ strations; *that is*, by observing the remote object and its marks at the  
 “ rising or setting of the sun, or by the marks, in a large *graduated* circle,  
 “ of the shadow’s ingress and egress. The sun, by turning back without  
 “ having reached *Macara*, destroys the south and the west; by turning  
 “ back without having reached *Carcata*, the north and east. By returning,  
 “ when he has just passed the winter solstitial point, he makes wealth secure  
 “ and grain abundant, since he moves thus according to nature; but  
 “ the sun, by moving unnaturally, excites terror.”

Now the *Hindu* astronomers agree, that the 1st of *January* 1790, was in the year 4891 of the *Caliyuga*, or their *fourth* period; at the beginning of which, they say, the equinoctial points were in the first degrees of *Més̥ha* and *Tulā*; but they are also of opinion, that the vernal equinox oscillates from the third of *Mina* to the twenty-seventh of *Més̥ha*, and back again, in 7200 years; which they divide into four *pádas*, and consequently that it moves, in the two intermediate *pádas*, from the first to the twenty-seventh of *Més̥ha*, and back again, in 3600 years; the colure cutting their ecliptic in the first of *Més̥ha*, which coincides with the first of *Aświni*, at the beginning of every such oscillatory period. VARA’HA, surnamed MIHIRA, or the Sun, from his knowledge of astronomy, and usually distinguished by the title of *Acharya*, or teacher of the *Vēda*, lived confessedly when the *Caliyuga* was far advanced; and, since by actual observation he found the solstitial points in the first degrees of *Carcata* and *Macara*, the equinoctial points were at the same time in the first of *Més̥ha* and *Tulā*: he lived, therefore, in the year 3600 of the fourth *Indian* period, or 1291 years before 1st *January* 1790, that is, about the year 499 of our era. This date  
 . corresponds

corresponds with the *ayanāṅśa*, or precession; calculated by the rule of the *Sūrya Siddhānta*; for  $19^{\circ} 21' 54''$  would be the precession of the equinox in 1291 years, according to the *Hindu* computation of  $54''$  annually, which gives us the origin of the *Indian* zodiac nearly; but, by NEWTON's demonstrations, which agree as well with the phenomena as the varying density of our earth will admit, the equinox recedes about  $50''$  every year, and has receded  $17^{\circ} 55' 50''$  since the time of VARA'HA, which gives us more nearly in our own sphere the first degree of *Mēṣa* in that of the *Hindus*. By the observation recorded in older *Sāstras*, the equinox had gone back  $23^{\circ} 20'$ , or about 1680 years had intervened between the age of the *Muni* and that of the modern astronomer: the former observation, therefore, must have been made about 2971 years before the 1st *January* 1790, that is 1181 before CHRIST.

WE come now to the commentary, which contains information of the greatest importance. By former *Sāstras* are meant, says BHATTO'TPALA, the books of PARA'SARA and of other *Munis*; and he then cites from the *Pārāśara Saṁhitā* the following passage, which is in modulated prose, and in a style much resembling that of the *Vēdas*:

SRAVISHTA'DYAT pauṣhnārdhāntan charah s'is'irò; vasantah pauṣhnārdhāt rōhinyāntan; saumyādyāda'slēṣhārdhāntan grīṣmah; prāvridaslēṣhārdhāt haṭāntan; chitrādyāt jyēṣht'hārdhāntan s'arat; hēmantò jyēṣht'hārdhāt vaiṣhn'avāntan.

“ THE season of *Sis'ira* is from the first of *Dhanishṭhā* to the middle of *Révaṇi*; that of *Vasanta* from the middle of *Révaṇi* to the end of *Rōhini*; that of *Grīṣma* from the beginning of *Mrigās'iras* to the middle of *As'leṣhā*;

“ *Aslêshà*; that of *Vershà* from the middle of *Aslêshà* to the end of *Hasa* ;  
 “ that of *Sarad* from the first of *Chitrà* to the middle of *Jyêsh'hà* ; that of  
 “ *Hémanta* from the middle of *Jyêsh'hà* to the end of *Sravanà*.”

THIS account of the six *Indian* seasons, each of which is co-extensive with two signs, or four lunar stations and a half, places the solstitial points, as VARA'HA has asserted, in the first degree of *Dhanish'hà*, and the middle, or  $6^{\circ} 40'$ , of *Aslêshà*, while the equinoctial points were in the *tenth* degree of *Bharanì* and  $3^{\circ} 20'$  of *Visàc'hà*; but in the time of VARA'HA, the solstitial colure passed through the 10th degree of *Punarvasu* and  $3^{\circ} 20'$  of *Uttarâshârà*, while the equinoctial colure cut the *Hindu* ecliptic in the first of *Ashwinì* and  $6^{\circ} 40'$  of *Chitrà*, or the *Yôga* and only star of that mansion, which, by the way, is indubitably the *Spike* of the Virgin; from the known longitude of which all other points in the *Indiân* Zodiac may be computed. It cannot escape notice, that PARA'SARA does not use in this passage the phrase *at present* which occurs in the text of VARA'HA; so that the places of the colures might have been ascertained *before* his time, and a considerable change might have happened in their true position without any change in the phrases, by which the seasons were distinguished, as our popular language in astronomy remains unaltered, though the zodiacal asterisms are now removed a whole sign from the places where they have left their names: it is manifest, nevertheless, that PARA'SARA must have written *within twelve centuries* before the beginning of our era; and that single fact, as we shall presently show, leads to very momentous consequences in regard to the system of *Indian* history and literature.

ON the comparison, which might easily be made, between the colures of PARA'SAR and those ascribed by EUDOXUS to CHIRON, the supposed assistant

sistant and instructor of the *Argonauts*, I shall say very little, because the whole *Argonautic* story (which neither was, according to HERODOTUS, nor, indeed, could have been originally *Grecian*) appears, even when stripped of its poetical and fabulous ornaments, extremely disputable; and, whether it was founded on a league of the *Helladian* princes and states, for the purpose of checking, on a favourable opportunity, the overgrown power of *Egypt*, or with a view to secure the commencement of the *Euxine* and appropriate the wealth of *Colchis*, or, as I am disposed to believe, on an emigration from *Africa* and *Asia* of that adventurous race who had first been established in *Chaldea*; whatever, in short, gave rise to the fable, which the old poets have so richly embellished, and the old historians have so inconsiderately adopted, it seems to me very clear, even on the principles of NEWTON, and on the same authorities to which he refers, that the voyage of the *Argonauts* must have preceded the year in which his calculations led him to place it. BATTUS built *Cyrene*, says our great philosopher, on the site of *Irasa*, the city of ANTÆUS, in the year 633 before CHRIST; yet he soon after calls EURIPYLUS, with whom the *Argonauts* had a conference, king of *Cyrene*; and in both passages he cites PINDAR, whom I acknowledge to have been the most learned, as well as the sublimest of poets. Now, if I understand PINDAR (which I will not assert, and I neither possess nor remember at present the *Scholia*, which I formerly perused) the fourth *Pythian* Ode begins with a short panegyric on ARCESILAS of *Cyrene*; “Where,” says the bard, “the priestesses, who sat near the golden eagles of Jove, prophesied of old, when APOLLO was not absent from his mansion, that BATTUS, the colonizer of fruitful *Lybia*, having just left the sacred isle (*Thera*) should build a city excelling in cars, on the splendid breast of earth, and, with the seventeenth generation, should refer to himself the *Therean* prediction of MEDEA, which that princess of the Col-

“ *chians*, that impetuous daughter of *Æetes*, breathed from her immortal mouth, and thus delivered to the half-divine mariners of the warrior “ *JASON*.” From this introduction to the noblest and most animated of the *Argonautic* poems, it appears that *fifteen complete generations* had intervened between the voyage of *JASON* and the emigration of *BATTUS*; so that, considering *three* generations as equal to *an hundred*, or *an hundred and twenty* years, which *NEWTON* admits to be the *Grecian* mode of computing them, we must place that voyage at least *five* or *six hundred* years before the time fixed by *NEWTON* himself, according to his own computation, for the building of *Cyrene*; that is, *eleven* or *twelve hundred and thirty-three* years before *CHRIST*: an age very near on a medium to that of *PARA’SARA*. If the poet means afterwards to say, as I understand him, that *ARCESILAS*, his contemporary, was the *eighth* in descent from *BATTUS*, we shall draw nearly the same conclusion, without having recourse to the unnatural reckoning of *thirty-three* or *forty* years to a generation; for *PINDAR* was forty years old when the *Persians*, having crossed the *Hellepont*, were nobly resisted at *Thermopylae*, and gloriously defeated at *Salamis*: he was born, therefore, about the *sixty-fifth Olympiad*, or five hundred and twenty years before our era; so that, by allowing more naturally *six* or *seven hundred* years to *twenty-three* generations, we may at a medium place the voyage of *JASON* about one thousand one hundred and seventy years before our Saviour, or about *forty-five* years before the beginning of the *Newtonian* chronology.

THE description of the old colures by *EUDOXUS*, if we implicitly rely on his testimony and on that of *HIPPARCHUS*, who was, indisputably, a great astronomer for the age in which he lived, affords, I allow, a sufficient evidence of some rude observation about 937 years before the *Christian* epoch; and, if the cardinal points had receded from those colures  $36^{\circ} 29' 10''$

at the beginning of the year 1690, and  $37^{\circ} 52' 30''$  on the first of *January* in the present year, they must have gone back  $3^{\circ} 23' 20''$  between the observation implied by *PARA'SAR* and that recorded by *EUDOXUS*; or, in other words, 244 years must have elapsed between the two observations: but this disquisition having little relation to our principal subject, I proceed to the last couplets of our *Indian* astronomer *VARA'HA MIHIRA*, which, though merely astrological and consequently absurd, will give occasion to remarks of no small importance. They imply, that, when the solstices are not in the first degrees of *Carcata* and *Mucara*, the motion of the sun is contrary to nature; and being caused, as the commentator intimates, by some *utpāta*, or preternatural agency, must necessarily be productive of misfortune; and this vain idea seems to indicate a very superficial knowledge even of the system which *VARA'HA* undertook to explain; but he might have adopted it solely as a religious tenet, on the authority of *GARGA*, a priest of eminent sanctity, who expresses the same wild notion in the following couplet:

Yadā nivartatē'prāptah śraviṣṭāmutterāyanē,  
 Aślēṣhān dachhinē'prāptastadāvidyānmahadbhayan.

“ WHEN *the sun* returns, not having reached *Dhanishṭhā* in the northern solstice, or not having reached *Aślēṣhā* in the southern, then let a man feel great apprehension of danger.”

*PARA'SARA* himself entertained a similar opinion, that any irregularity in the solstices would indicate approaching calamity: *Yadāprāptē vaiṣṇu-vāntam*, says he, *udanmārgē prepadyatē, dachhinē aślēṣhām vā mahābhayaḥ*; that is, “ When, having reached the end of *Sravanā*, in the northern path, or half of *Aślēṣhā*, in the southern, he still advances, it is a cause of great fear.” This notion possibly had its rise before the regular precession of



the cardinal points had been observed; but we may also remark, that some of the lunar mansions were considered as inauspicious, and others as fortunate: thus MENU, the first *Indian* lawgiver, ordains, that certain rites shall be performed under the influence of a happy *Nacshatra*; and, where he forbids any female name to be taken from a constellation, the most learned commentator gives *Ārdra* and *Révatī* as examples of ill omened names, appearing by design to skip over others, that must first have occurred to him. Whether *Dhanishṭhā* and *Aślṣhā* were inauspicious or prosperous, I have not learned; but, whatever might be the ground of VARA'HA's astrological rule, we may collect from his astronomy, which was grounded on observation, that the solstice had receded at least  $23^{\circ} 20'$  between his time and that of PARA'SARA; for, though he refers its position to the *signs* instead of the *lunar mansions*, yet all the *Pandits* with whom I have conversed on the subject, unanimously assert, that the first degrees of *Mēsha* and *Āśvinī* are coincident. Since the two ancient sages name only the lunar asterisms, it is probable that the solar division of the zodiac into twelve signs was not generally used in their days; and we know from the comment on the *Sūrya Siddhānta*, that the lunar month, by which all religious ceremonies are still regulated, was in use before the solar. When M. BAILEY asks, "why the *Hindus* established the beginning of the "precession, according to their ideas of it, in the year of CHRIST 499?" to which his calculations also had led him, we answer, Because in that year the vernal equinox was found by observation in the origin of their ecliptic; and since they were of opinion that it must have had the same position in the first year of the *Caliyuga*, they were induced by their erroneous theory to fix the beginning of their fourth period 3600 years before the time of VARA'HA, and to account for PARA'SARA's observation by supposing an *utpāta*, or *prodigy*.

To what purpose, it may be asked, have we ascertained the age of the *Munis*? Who was PARA'SARA? Who was GARGA? With whom were they contemporary, or with whose age may theirs be compared? What light will these inquiries throw on the history of *India* or of mankind? I am happy in being able to answer those questions with confidence and precision.

ALL the *Brâhmens* agree, that only one PARA'SARA is named in their sacred records; that he composed the astronomical book before cited, and a law-tract, which is now in my possession; that he was the grandson of VASISHT'HA, another astronomer and legislator, whose works are still extant, and who was the preceptor of RA'MA, king of *Ayôdhyâ*; that he was the father of VYA'SA, by whom the *Vêdas* were arranged in the form which they now bear, and whom CRISHNA himself names with exalted praise in the *Gîtâ*; so that by the admission of the *Pandits* themselves, we find only three generations between two of the RA'MAS, whom they consider as incarnate *portions* of the divinity; and PARA'SAR might have lived till the beginning of the *Caliyuga*, which the mistaken doctrine of an oscillation in the cardinal points has compelled the *Hindus* to place 1920 years too early. This error, added to their fanciful arrangement of the four ages, has been the source of many absurdities; for they insist that VA'LMIC, whom they cannot but allow to have been contemporary with RA'MACHANDRA, lived in the age of VYA'SA, who consulted him on the composition of the *Muhâbhârat*, and who was personally known to BALARA'MA, the brother of CRISHNA. When a very learned *Brâhmen* had repeated to me an agreeable story of a conversation between VA'LMIC and VYA'SA, I expressed my surprise at an interview between two bards, whose ages were separated by a period of 864,000; but he soon reconciled himself to so monstrous an anachronism,

anachronism, by observing that the longevity of the *Munis* was preternatural, and that no limit could be set to divine power. By the same recourse to miracles or to prophecy, he would have answered another objection equally fatal to his chronological system. It is agreed by all, that the lawyer YA'GY-AWALCYA was an attendant on the court of JANACA, whose daughter SI'RA' was the constant but unfortunate wife of the great RA'MA, the hero of V'ALMIC's poem; but that lawyer himself, at the very opening of his work, which now lies before me, names both PARA'SAR and VYA'SA among twenty authors, whose tracts form the body of original *Indian* law. By the way, since VASISHT'HA is more than once named in the *Mānavīsanhitā*, we may be certain that the laws ascribed to MENU, in whatever age they might have been first promulgated, could not have received the form in which we now see them above *three thousand* years ago. The age and functions of GARGA lead to consequences yet more interesting: he was confessedly the *purōhita*, or officiating priest, of CRISHNA himself, who, when only a herdsmen's boy at *Mat'hurā*, revealed his divine character to GARGA, by running to him with more than mortal benignity on his countenance, when the priest had invoked NA'RA'YAN. His daughter was eminent for her piety and her learning; and the *Brāhmins* admit, without considering the consequence of their admission, that she is thus addressed in the *Vēdu* itself: *Yata ūrāhwan nō vā samōpi*, GA'RGI, *īsha ādityō dyāmārdhānan tapātī, dyā vā bhūmin tapātī, bhūmyā subhāran tapātī, lōcān tapātī, antaran tapātyanantaran tapātī*; or, “ That Sun, O daughter of GARGA, “ than which nothing is higher, to which nothing is equal, enlightens “ the summit of the sky; with the sky enlightens the earth; with the “ earth enlightens the lower worlds; enlightens the higher worlds, enlightens other worlds; it enlightens the breast, enlightens all besides the “ breast.” From these facts, which the *Brāhmins* cannot deny, and from these

these concessions which they unanimously make, we may reasonably infer, that, if VYA'SA was not the composer of the *Védas*, he added at least something of his own to the scattered fragments of a more ancient work, or perhaps to the loose traditions, which he had collected; but, whatever be the comparative antiquity of the *Hindu* scriptures, we may safely conclude that the *Mosaic* and *Indian* chronologies are perfectly consistent; that MENU, son of BRAHMA', was the *Adima*, or *first* created mortal, and consequently our ADAM; that MENU, child of the Sun, was preserved with *seven* others in a *bahitra*, or capacious ark, from an universal deluge, and must therefore be our NOAH; that HIRANYACASIPU, *the giant with a golden axe*, and *Vali*, or *Bali*, were impious and arrogant monarchs,\* and most probably our NIMROD and BELUS; that the three RAMAS, two of whom were invincible warriors, and the third, not only valiant in war but the patron of agriculture and *wine*, which derives an epithet from his name, were different representations of the *Grecian* BACCHUS, and either the RA'MA of Scripture, or his colony personified, or the Sun first adored by his idolatrous family; that a considerable emigration from *Chaldea* into *Greece*, *Italy*, and *India*, happened about *twelve* centuries before the birth of our Saviour; that SA'CYA, or SI'SAK, about two hundred years after VYA'SA, either in person or by a colony from *Egypt*, imported into this country the mild heresy of the ancient *Baudlhas*; and that the dawn of true *Indian* history appears only three or four centuries before the *Christian* era, the preceding ages being clouded by allegory or fable.

As a specimen of that fabling and allegorizing spirit which has ever induced the *Bráhmens* to disguise their whole system of history, philosophy, and religion, I produce a passage from the *Bhágavat*, which, however  
strange

strange and ridiculous, is very curious in itself, and closely connected with the subject of this essay: it is taken from the fifth *Scandha*, or section, which is written in modulated prose. "There are some," says the *Indian* author, "who, for the purpose of meditating intensely on the holy son of VASU-DE'VA, imagine yon celestial sphere to represent the figure of that aquatic animal which we call *Sis'umára*. Its head being turned downwards, and its body bent in a circle, they conceive *Dhruva*, or the pole-star, to be fixed on the point of its tail; on the middle part of the tail they see four stars, *Prejápati*, *Agni*, *Indra*, *Dherma*; and on its base two others, *Dhatri* and *Vidhatri*: on its rump are the *Septarshis*, or seven stars of the *Sacata*, or *Wain*; on its back the path of the Sun, called *Ajaví'hí*, or the *Series of Kids*; on its belly the *Gangá* of the sky: *Punarvasu* and *Pushya* gleam respectively on its right and left haunches; *Árdra* and *Aśléshá* on its right and left feet, or *fins*; *Abhijit* and *Uttaráshá'd'há* in its right and left nostrils; *Sravaná* and *Purváshád'há* in its right and left eyes; *Dhanisht'há* and *Múla* on its right and left ears. Eight constellations belonging to the summer solstice, *Maghá*, *Púrvap'halguní*, *Uttarap'halguní*, *Hastá*, *Chitrá*, *Svátí*, *Víśúc'há*, and *Anurádhá*, may be conceived in the ribs of its left side; and as many asterisms, connected with the winter solstice, *Mrigas'íras*, *Róhini*, *Critticá*, *Bharaní*, *Aśviní*, *Révatí*, *Uttarabhadrapadá*, and *Púrvabhadrapadá*, may be imagined on the ribs of its right side in an inverse order: let *Satabhishá* and *Jyēsh't'há* be placed on its right and left shoulders. In its upper jaw is *Agastya*, in its lower *Yama*; in its mouth the planet *Mangala*; in its part of generation *Sanaí's'chara*; on its hump *Vrihats'pati*; in its breast the Sun; in its heart *Náráyan*; in its front the Moon; in its navel *Us'anas*; on its two nipples the two *Aśvinas*; in its ascending and descending breath *Budha*; on its throat *Ráhu*; in all its limbs *Cétus*, or comets; and in its hairs, or bristles,

" the

“ the whole multitude of stars.” It is necessary to remark, that, although the *śiśumāra* be generally described as the *sea-hog* or *porpoise*, which we frequently have seen playing in the *Ganges*, yet *śiśmār*, which seems derived from the *Sanscrit*, means in *Persian* a large *lizard*. The passage just exhibited may nevertheless relate to an animal of the cetaceous order, and possibly to the dolphin of the ancients. Before I leave the sphere of the *Hindus*, I cannot help mentioning a singular fact :—In the *Sanscrit* language *Ricsha* means a *constellation* and a *bear*, so that *Maharicsha* may denote either a *great bear* or a *great asterism*. Etymologists may, perhaps, derive the *Megas arctos* of the *Greeks* from an *Indian* compound ill understood ; but I will only observe, with the wild *American*, that a bear *with a very long tail* could never have occurred to the imagination of any one who had seen the animal. I may be permitted to add, on the subject of the *Indian Zodiac*, that, if I have erred in a former essay, where the longitude of the lunar mansions is computed from the first star in our constellation of the Ram, I have been led into an error by the very learned and ingenious M. BAILLY, who relied, I presume, on the authority of M. LE GENIIL. The origin of the *Hindu Zodiac*, according to the *Sūrya Siddhānta*, must be nearly  $\gamma$   $19^{\circ} 21' 54''$ , in our sphere ; and the longitude of *Chitrā*, or the Spike, must of course be  $199^{\circ} 21' 54''$  from the vernal equinox ; but, since it is difficult by that computation to arrange the twenty-seven mansions and their several stars as they are delineated and enumerated in the *Retnamālā*, I must for the present suppose with M. BAILLY, that the *Zodiac* of the *Hindus* had two origins, one constant and the other variable : and a farther inquiry into the subject must be reserved for a season of retirement and leisure.

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*JATAMANSI,*

*or Indian Spikenard.*



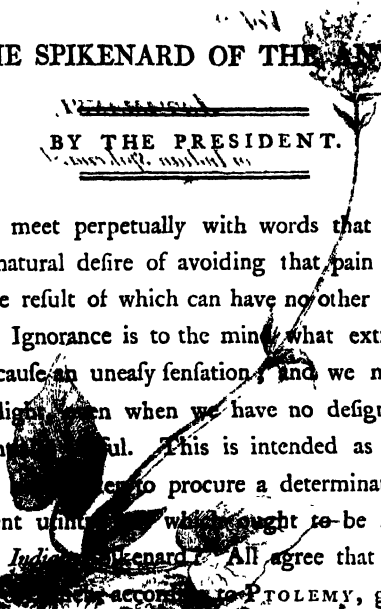
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## XXVIII.

### ON THE SPIKENARD OF THE INDIANS.

BY THE PRESIDENT.



IT is painful to meet perpetually with words that convey no distinct ideas; and a natural desire of avoiding that pain excites us often to make inquiries, the result of which can have no other use than to give us clear conceptions. Ignorance is to the mind what extreme darkness is to the nerves: both cause an uneasy sensation, and we naturally love knowledge, as we love light, even when we have no design of applying either to a purpose essentially useful. This is intended as an apology for the pains which have been taken to procure a determinate answer to a question of no apparent utility, which ought to be readily answered in *India*, "What is *Indian Spikenard*?" All agree that it is an odoriferous plant, the best known, according to *PTOLEMY*, grew about *Rangamritica*, or *Rangamati*, and on the borders of the country now called *Butàn*: it is mentioned by *DIOSCORIDES*, whose work I have not in my possession; but his description of it must be very imperfect, since neither *LINNEUS* nor any of his disciples pretend to class it with certainty; and, in the latest botanical work, it is ranked as *unknown*. I had indeed before I was personally acquainted with *KOENIG*, that he had ascertained it; but he assured me that he knew not what the *Greek* writers meant by the word *Spikenard*, and indeed, and described a sixth species of the *nardus*, which is called *Indian* in the



Supplement to *Linnaeus*; but the *nardus* is a grass which, though it bear a *spike*, no man ever supposed to be the *true* Spikenard, which the great Botanical Philosopher himself was inclined to think a species of *Andropogon*, and places, in his *Materia Medica*, but with an expression of doubt, among his polygamous plants. Since the death of KOENIG I have consulted every botanist and physician with whom I was acquainted, on the subject before us; but all have confessed without reserve, though not without some regret, that they were ignorant what was meant by the *Indian* Spikenard.

IN order to procure information from the learned natives, it was necessary to know the *name* of the plant in some *Asiatic* language. The very word *nard* occurs in the Song of SOLOMON: but the name and the thing were both exotic: the *Hebrew* lexicographers imagine both to be *Indian*; but the word is in truth *Persian*, and occurs in the following distich of an old poet:

A'n chu bikheft, ín chu nardest, án chu shákheft, ín chu bàr,  
A'n chu bíkhì páyidárest ín chu nardì páyidàr.

IT is not easy to determine in this couplet, whether *nard* means the *stem*, or, as ANJU' explains it, the *piñh*; but it is manifestly a part of a vegetable, and neither the *root*, the *fruit*, nor the *branch*, which are all separately named. The *Arabs* have borrowed the word *nard* but in the sense, as we learn from the *Kámùs*, of a *compound medicinal unguent*. Whatever it signified in old *Persian*, the *Arabic* word *fumbul*, which, like *fumbalah*, means an *ear* or *spike*, has long been substituted for it; and there can be no doubt that by the *fumbul* of *India* the *Muselmáns* understand the same plant with the *nard* of PTOLEMY and the *Nardostachys*, or *Spikenard*, of

GALEN;

GALEN; who, by the way, was deceived by the dry specimens which he had seen, and mistook them for *roots*.

A SINGULAR description of the *jumbul* by ABU'LEFAZL, who frequently mentions it as an ingredient in *Indian* perfumes, had for some time almost convinced me that the *true Spikenard* was the *Cétaca*, or *Pandanus* of our botanists: his words are, *Sumbul panj berg dâred, ceh dirâzii ân dah angosh-testu pahmâi seh*, or, “The *jumbul* has five leaves, ten fingers long, and “three broad.” Now I well knew that the minister of ACBAR was not a botanist, and might easily have mistaken a thyrsus for a single flower: I had seen no blossom, or assemblage of blossoms, of such dimensions, except the male *Cétaca*; and, though the *Persian* writer describes the female as a different plant, by the vulgar name *Cyôra*, yet such a mistake might naturally have been expected in such a work: but what most confirmed my opinion, was the exquisite fragrance of the *Cétaca*-flower, which to my sense far surpassed the richest perfumes of *Europe* or *Asia*. Scarce a doubt remained when I met with a description of the *Cétaca* by FORSKÖHL, whose words are so perfectly applicable to the general idea which we are apt to form of *Spikenard*, that I give you a literal translation of them: “The *Pandanus* is an incomparable plant, and cultivated for its odour, “which it breathes so richly, that one or two *spikes*, in a situation rather “humid, would be sufficient to diffuse an odoriferous air for a long time “through a spacious apartment; so that the natives in general are not foli- “citous about the living plants, but *purchase the spikes at a great price*.” I learned also, that a fragrant essential oil was extracted from the flowers; and I procured from *Banâres* a large phial of it, which was adulterated with sandal; but the very adulteration convinced me that the genuine essence must be valuable, from the great number of thyrsi that must  
be

be required in preparing a small quantity of it. Thus had I nearly persuaded myself that the true nard was to be found on the *Banks of the Ganges*, where the *Hindu* women roll up its flowers in their long black hair after bathing in the holy river; and I imagined that the *precious alabafter-box* mentioned in the Scripture, and the *small onyx*, in exchange for which the poet offers to entertain his friend with *a cask of old wine*, contained an essence of the same kind, though differing in its degree of purity with the nard which I had procured. But an *Arab* of *Mecca*, who saw in my study some flowers of the *Cétaca*, informed me that the plant was extremely common in *Arabia*, where it was named *Cádhi*; and several *Mahomedans* of rank and learning have since assured me that the true name of the *Indian Sumbul* was not *Cétaca*, but *Jatámánsi*. This was important information: finding therefore that the *Pandanus* was not peculiar to *Hindustán*, and considering that the *Sumbul* of *ABU'LFÄZL* differed from it in the precise number of leaves on the thyrsus, in the colour, and in the season of flowering, though the length and breadth corresponded very nearly, I abandoned my first opinion, and began to inquire eagerly for the *Jatámánsi*, which grew, I was told, in the garden of a learned and ingenious friend, and fortunately was then in blossom. A fresh plant was very soon brought to me: it appeared on inspection to be a most elegant *Cypirus*, with a polished three-sided culm, an umbella with three or four ensiform leaflets minutely serrated, naked proliferous peduncles, crowded spikes, expanded daggers; and its branchy root had a pungent taste with a faint aromatic odour; but no part of it bore the least resemblance to the drug known in *Europe* by the appellation of *Spikenard*; and a *Muselman* physician from *Dehli* assured me positively, that the plant was not *Jatámánsi*, but *Súd*, as it is named in *Arabic*; which the author of the *Tohfatu'l Múmenin* particularly distinguishes from the *Indian Sumbul*. He produced on the next day an extract  
from

from the Dictionary of Natural History, to which he had referred; and I present you with a translation of all that is material in it.

“ 1. *SUD* has a roundish olive-shaped root, externally black, but white internally, and so fragrant as to have obtained in *Persia* the name of “ *Subterranean Musk*: its leaf has some resemblance to that of a leek, but “ is longer and narrower, strong, somewhat rough at the edges, and tapering to a point. 2. *SUMBUL* means a *spike* or *ear*, and was called *nard* “ by the *Greeks*. There are three sorts of *Sumbul* or *Nardin*; but when “ the word stands alone, it means the *Sumbul* of *India*, which is an herb “ without flower or fruit (he speaks of the drug only) like the tail of an “ ermine, or of a small weasel, but not quite so thick, and about the length “ of a finger. It is darkish, inclining to yellow, and very fragrant: it is “ brought from *Hindustán*, and its medicinal virtue lasts three years.” It was easy to procure the dry *Jatámánsi*, which corresponded perfectly with the description of the *Sumbul*; and, though a native *Muselman* afterwards gave me a *Persian* paper, written by himself, in which he represents the *Sumbul* of *India*, the *Sweet Sumbul*, and the *Jatámánsi* as three different plants, yet the authority of the *Tokfatu'l Múnénin* is decisive that the *faeet Sumbul* is only another denomination of *nard*; and the physician who produced that authority, brought, as a specimen of *Sumbul*, the very same drug which my *Pandit*, who is also a physician, brought as a specimen of the *Jatámánsi*. A *Bráhmen* of eminent learning gave me a parcel of the same sort, and told me that it was used in their sacrifices; that, when fresh, it was exquisitely sweet, and added much to the scent of rich essences, in which it was a principal ingredient; that the merchants brought it from the mountainous country to the north-east of *Bengal*; that it was the entire plant, not a part of it, and received its *Sanscrit* names from

from its resemblance to *locks of hair*; as it is called *Spikenard*, I suppose, from its resemblance to a spike, when it is dried, and not from the configuration of its flowers, which the *Greeks*, probably, never examined. The *Persian* author describes the whole plant as resembling the tail of an ermine; and the *Jatámánsi*, which is manifestly the *Spikenard* of our drug-gifts, has precisely that form, consisting of withered stalks and ribs of leaves, cohering in a bundle of yellowish brown capillary fibres, and constituting a spike about the size of a small finger. We may on the whole be assured, that the *nardus* of *PTOLEMY*, the *Indian Sumbul* of the *Persians* and *Arabs*, the *Jatámánsi* of the *Hindus*, and the *Spikenard* of our shops, are one and the same plant; but to what class and genus it belongs in the *Linnean* system, can only be ascertained by an inspection of the fresh blossoms. Dr. PATRICK RUSSEL, who always communicates with obliging facility his extensive and accurate knowledge, informed me by letter, that “*Spikenard* is carried over the desert (from *India* I presume) “ to *Aleppo*, where it is used in substance, mixed with other perfumes, “ and worn in small bags, or in the form of essence, and kept in little boxes “ or phials, like *djar* of roses.” He is persuaded, and so am I, that the *Indian* nard of the ancients and that of our shops, is one and the same vegetable.

THOUGH diligent researches have been made at my request on the borders of *Bengal* and *Behár*, yet the *Jatámánsi* has not been found growing in any part of the *British* territories. Mr. SAUNDERS, who met with it in *Bután*, where, as he was informed, it is very common, and whence it is brought in a dry state to *Rangpúr*, has no hesitation in pronouncing it a species of the *Baccharis*; and, since it is not possible that he could mistake the *natural order* and *essential character*

rafter of the plant which he examined, I had no doubt that the *Jatámánsi* was composited and corymbiferous with stamens connected by the anthers, and with female prolific florets intermixed with hermaphrodites. The word *Spike* was not used by the antients with botanical precision; and the *Stachys* itself is verticillated, with only two species out of fifteen that could justify its generic appellation. I therefore concluded, that the true *Spikenard* was a *Baccharis*, and that, while the philosopher had been searching for it to no purpose,

————— the dull swain  
Trode on it daily with his clouted shoon;

for the *Baccharis*, it seems, as well as the *Conyza*, is called by our gardeners, *Ploughmens Spikenard*. I suspected, nevertheless, that the plant which Mr. SAUNDERS described was not *Jatámánsi*, because I knew that the people of *Bután* had no such name for it, but distinguished it by very different names in different parts of their hilly country. I knew also that the *Butías*, who set a greater value on the drug than it seems as a perfume to merit, were extremely reserved in giving information concerning it; and might be tempted, by the narrow spirit of monopoly, to mislead an inquirer for the fresh plant. The friendly zeal of Mr. PURLING will probably procure it in a state of vegetation; for, when he had the kindness at my desire to make inquiries for it among the *Bután* merchants, they assured him that the living plants could not be obtained without an order from their sovereign the *Dévarájà*, to whom he immediately dispatched a messenger, with an earnest request that eight or ten of the growing plants might be sent to him at *Rangpùr*. Should the *Dévarájà* comply with that request, and should the vegetable flourish in the plain of *Bengal*, we shall have ocular proof of its class, order, genus, and species; and, if it prove the same with the *Jatámánsi* of *Népál*, which I now must introduce to

your acquaintance, the question with which I began this essay will be satisfactorily answered.

HAVING traced the *Indian* Spikenard, by the name of *Jatámánsi*, to the mountains of *Népál*, I requested my friend Mr. Law, who then resided at *Gayá*, to procure some of the recent plants by the means of the *Népalese* pilgrims ; who, being orthodox *Hindus* and possessing many rare books in the *Sanfrit* language, were more likely than the *Butias* to know the true *Jatámánsi*, by which name they generally distinguish it. Many young plants were accordingly sent to *Gayá*, with a *Persian* letter, specifically naming them, and apparently written by a man of rank and literature ; so that no suspicion of deception or of error can be justly entertained. By a mistake of the gardener they were *all* planted at *Guyá*, where they have blossomed, and at first seemed to flourish : I must therefore describe the *Jatámánsi* from the report of Mr. BURT, who favoured me with a drawing of it, and in whose accuracy we may perfectly confide ; but, before I produce the description, I must endeavour to remove a prejudice, in regard to the *natural order* of the spikenard, which they who are addicted to swear by every word of their master LINNÆUS, will hardly abandon, and which I, who love truth better than him, have abandoned with some reluctance. *Nard* has been generally supposed to be a *grass* ; and the word *stachys*, or *spike*, which agrees with the habit of that natural order, gave rise, perhaps, to the supposition. There is a plant in *Java* which most travellers and some physicians call *spikenard* ; and the Governor of *Chinsura*, who is kindly endeavouring to procure it thence in a state fit for examination, writes me word, that “ a *Dutch* author pronounces it “ a *grass* like the *Cyperus* ; but insists that what we call the *spike* is the “ fibrous part above the root, as long as a man’s little finger ; of a “ brownish

“ brownish hue, inclining to red or yellow, rather fragrant, and with  
 “ a pungent but aromatic scent.” This is too slovenly a description to  
 have been written by a botanist; yet I believe the latter part of it to be  
 tolerably correct, and should imagine that the plant was the same with our  
*Jatámansi*, if it were not commonly asserted that the *Javan* spikenard was  
 used as a condiment; and if a well-informed man, who had seen it in the  
 island, had not assured me that it was a sort of *Pimento*, and consequently  
 a species of *Myrtle*, and of the order now called *Hesperian*. The resem-  
 blance before mentioned between the *Indian fumbul* and the *Arabian Sad*, or  
*Cypirus*, had led me to suspect that the true nard was a *grass* or a *reed*; and,  
 as this country abounds in *odoriferous grasses*, I began to collect them from  
 all quarters. Colonel KYP obligingly sent me two plants with sweet-smell-  
 ing roots; and as they were known to the *Pandits*, I soon found their names  
 in a *Sanscrit* dictionary: one of them is called *gandhas’at’hî*, and used by  
 the *Hindus* to scent the red powder of *Sapan*, or *Bakkam*-wood, which they  
 scatter in the festival of the vernal season; the other has many names, and,  
 among them, *nigaramastac* and *gónarda*, the second of which means *rustling*  
*in the water*; for all the *Pandits* insist that *nard* is never used as a noun  
 in *Sanscrit*, and signifies, as the root of a verb, *to sound* or *to rustle*.  
 Soon after, Mr. BURROW brought me from the *Banks of the Ganges*, near  
*Herikvár*, a very fragrant grass, which in some places covers whole acres,  
 and diffuses, when crushed, so strong an odour, that a person, he says,  
 might easily have smelt it (as ALEXANDER is reported to have smelt the nard  
 of *Gedrofa*) from the back of an elephant: its blossoms were not preserved,  
 and it cannot therefore be described. From Mr. BLANE of *Lucenov*  
 I received a fresh plant, which has not flowered at *Calcutta*; but I  
 rely implicitly on his authority, and have no doubt that it is a species of  
*Andropogon*: it has rather a rank aromatic odour; and, from the virtue



ascribed to it of curing intermittent fevers, is known by the *Sanſcrit* name of *jwarāncus'a*, which literally means a *fever-hook*, and alludes to the *iron-hook* with which elephants are managed. Lastly, Dr. ANDERSON of *Madras*, who delights in useful pursuits, and in assisting the pursuits of others, favoured me with a complete specimen of the *Andropogon Nardus*, one of the most common grasses on the coast, and flourishing most luxuriantly on the mountains, never eaten by cattle, but extremely grateful to bees; and containing an essential oil, which, he understands, is extracted from it in many parts of *Hindustān*, and used as an *atar* or *perfume*. He adds a very curious philological remark, that, in the *Tamul* dictionary, most words beginning with *nār* have some relation to *fragrance*; as *nīrukeradu*, to yield an odour; *nārtum pillu*, lemon-grass; *nārtei*, citron; *nārta manum*, the wild orange-tree; *nārum panei*, the *Indian Jasmin*; *nārum alleri*, a strong smelling-flower; and *nārtu*, which is put for *nard* in the *Tamul* version of our Scriptures; so that not only the *nard* of the *Hebrews* and *Greeks*, but even the *copia narum* of HORACE, may be derived from an *Indian* root. To this I can only say, that I have not met with any such root in *Sanſcrit*, the oldest polished language of *India*; and that in *Persian*, which has a manifest affinity with it, *nār* means a *pomegranate*, and *nārgil* (a word originally *Sanſcrit*) a *cocoa-nut*; neither of which has any remarkable fragrance.

SUCH is the evidence in support of the opinion given by the great *Swedish* naturalist, that the true nard was a gramineous plant, and a species of *Andropogon*; but since no grass that I have yet seen bears any resemblance to the *Jatāmāṣi*, which I conceive to be the *nardus* of the ancients, I beg leave to express my dissent, with some confidence as a philologer, though with humble diffidence as a student in botany. I am not, indeed, of opinion that the *nardum* of the *Romans* was merely the essential oil

of the plant from which it was denominated, but am strongly inclined to believe that it was a *generic* word, meaning what we now call *diar*, and either the *diar* of roses from *Cashmír* and *Persia*; that of *Cétara*, or *Pandanus*, from the western coast of *India*; or that of *Aguru*, or aloe-wood, from *Afām* or *Cochinchina*, the process of obtaining which is described by ABU'LEAZL, or the mixed perfume, called *ábir*, of which the principal ingredients were yellow sandal, violets, orange-flowers, wood of aloes, rose-water, musk, and true spikenard: all those essences and compositions were costly; and, most of them being sold by the *Indians* to the *Persians* and *Arabs*, from whom, in the time of OCTAVIUS, they were received by the *Syrians* and *Romans*, they must have been extremely dear at *Jerusalem* and at *Rome*. There might also have been a pure *nardine oil*, as ATHENÆUS calls it; but *nardum* probably meant (and KOENIG was of the same opinion) an *Indian* essence in general, taking its name from that ingredient which had, or was commonly thought to have, the most exquisite scent. But I have been drawn by a pleasing subject to a greater length than I expected, and proceed to the promised description of the *true nard*, or *Jatámánsi*, which by the way has other names in the *Amarcúsh*; the smoothest of which are *jatílá* and *lómásá*, both derived from words meaning *hair*. Mr. BURT, after a modest apology for his imperfect acquaintance with the language of botanists, has favoured me with an account of the plant; on the correctness of which I have a perfect reliance, from which I collect the following *natural characters*:

## AGGREGATF.

*Cal.* Scarce any. *Margin*, hardly discernible.

*Cor.* One petal. *Tube* somewhat gibbous. *Border* five-cleft.

*Stam.* Three *Anthems*.

*Pist.* Germ beneath. One *Style* erect.

*Seed*

*Seed* solitary, crowned with a pappus.

*Root* fibrous.

*Leaves* hearted, fourfold ; *radical* leaves petioled.

It appears, therefore, to be the *Protean* plant, VALERIAN, a sister of the Mountain and *Celtic* Nard, and of a species which I should describe in the *Linnean* style : VALERIANA JATA'MA'NSI *floribus triandris, foliis cordatis quaternis, radicalibus petiolatis*. The radical leaves, rising from the ground and enfolding the young stem, are plucked up with a part of the root, and, being dried in the sun or by an artificial heat, are sold as a drug, which from its appearance has been called *spikenard* ; though, as the *Persian* writer observes, it might be compared more properly to the *tail of an ermine* : when nothing remains but the dry fibres of the leaves, which retain their original form, they have some resemblance to a *lock of hair*, from which the *Sanscrit* name, it seems, is derived. Two mercantile agents from *Bután*, on the part of the *Dévardjá*, were examined at my request by Mr. HARRINGTON, and informed him that the drug, which the *Bengalese* called *Jatámánsi*, “ grew erect above the surface of the ground, resembling in “ colour an ear of green wheat ; that when recent it had a faint odour, “ which was greatly increased by the simple process of drying it ; that it “ abounded on the hills, and even on the plains, of *Bután*, where it was “ collected and prepared for medicinal purposes.” What its virtues are, experience alone can ascertain ; but, as far as botanical analogy can justify a conjecture, we may suppose them to be antispasmodic ; and in our provinces, especially in *Bahar*, the plant will probably flourish ; so that we may always procure it in a state fit for experiment. On the description of the *Indian* spikenard, compared with the drawing, I must observe that, though all the leaves as delineated may not appear of the same shape, yet

yet all of them are not fully expanded. Mr. BURT assures me, that the four radical leaves are *hearted and petioled*; and it is most probable that the cauline and floral leaves would have a similar form in their state of perfect expansion; but, unfortunately, the plants at *Gayá* are now shrivelled; and they who seek farther information must wait with patience until new stems and leaves shall spring from the roots, or other plants shall be brought from *Népál* and *Bután*. On the proposed inquiry into the virtues of this celebrated plant, I must be permitted to say, that, although many botanists may have wasted their time in enumerating the qualities of vegetables, without having ascertained them by repeated and satisfactory experiments, and although *mere botany* goes no farther than technical arrangement and description, yet it seems indubitable, that the great end and aim of a botanical philosopher is to discover and prove the several uses of the vegetable system; and while he admits, with HIPPOCRATES, the *fallaciousness of experience*, to rely on experiment alone as the basis of his knowledge.



# APPENDIX.

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A

METEOROLOGICAL DIARY,

KEPT AT CALCUTTA,

BY HENRY TRAIL, ESQ.

*From 1st February 1784, to 31st December 1785.*



## R E M A R K S.

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**I**N the following Diary of the weather, begun the 1st February 1734, every change in the air was marked down with the greatest precision three times every day, and always nearly at the same hours, viz. at sun-rising, at three, or half past three o'clock in the afternoon, and at eleven o'clock at night.

WHILE the wind continued southerly, the Thermometer was placed in a Verandah open to the Esplanade, where there was at all times a free circulation of air; and when the wind became northerly, the instrument was removed to the opposite side of the house, and equally exposed, as in the preceding part of the year.

THE Barometer continued always in the same place.

THE Hygrometer made use of was a bit of fine sponge, suspended in a scale (on the end of a steelyard) first prepared for more easily imbibing the moisture, by dipping it in a solution of Salt of Tartar, afterwards drying it well, and bringing it to an equilibrium by a weight in the opposite scale, at a time when the atmosphere appeared to have the least degree of moisture.

A SEMICIRCULAR scale at the top, divided from 0 to 90° on each side, with the needle of the yard, pointed out the quantity of moisture gained or lost daily; but in the following Diary the degrees of moisture have seldom been taken down.



EVERY fall of rain was likewise taken, and the quantity in cubic inches daily noted down.

THE winds were also observed; and the figures (0, 1, 2, 3, 4) denote the force thereof.

HERE it may be remarked, that at sun-rising there is seldom or ever any wind; but no sooner is the air a little rarefied by its rays, than a little breeze begins, and this generally increases till about noon, when again it begins to lose its force and dies away, from the same cause.

IN order to ascertain the influence of the Moon upon the weather, the mean temperature, as well as the weight of the atmosphere of each quarter, is accurately marked down by taking in the three days preceding and the three days after the change, with the intermediate day. From these the density is discovered, by the following rule given by Dr. BRADLEY, viz.

a, altitude of Barometer; b, altitude of Thermometer; d, Density.

$$\frac{A}{B \times 350} = D \text{ — or Density.}$$

N. B. In this, the mean morning density is only taken; however, the mean density for the whole day may be found by the same rule.

JANUARY 1, 1785. From an examination of one year's observations on the influence of the Moon on the mercury in the Barometer, it does not appear that there is any certain rule to be laid down regarding it; however,

ever, it may be affirmed that the direction of the winds has more effect upon it, as we never fail to see the mercury highest when the wind blows from the NW ; in a lesser degree from the N, and lowest of all when it proceeds from the SE quarters.

*A General*

*A General State of the Weather for February 1785.*

		M.	N.	E.	
Greatest altitude of the Thermometer,	-	75°	86	76	} 74 Mean temperature.
Least ditto,	-	66	70	68	
Mean ditto,	-	72	79	73	
Clear,	-	-	-	3 days.	
Cloudy,	-	-	-	26 do.	
N <sup>o</sup> of days on which it rained,	-	-	-	8 do.	
Quantity of rain,	-	-	-	4 2 Inch.	

THIS month the wind very variable, and the atmosphere for the most part cloudy, and sometimes several days succeeding without any sun ; the air also damp and cold. Frequently thunder, and on the 8th there was a fall of hail in the afternoon accompanied with thunder.

THE mornings generally foggy.

# APPENDIX.

Calcutta, February 1784.

Day.	Thermom.			Mean morning density of each quarter of the Moon.	Rain Inch	Wind.		Appearance of the air.	REMARKS.
	M	N	E			Point	Force		
1	68	75	72	Full M. 70 $\frac{3}{7}$	1.	W	0	Cloudy	SUNDAY.
2	68	78	72			N	0	—	Heavy, with a great appearance
3	67	74	69			NE	0	—	rain.
4	68	77	68			S	0	—	Ditto.
5	71	79	72			SW	1	—	—
6	72	80	74			NW	1	—	A thick fog all day.
7	71	82	75			S	2	Clear	—
8	70	80	74	L. Q. 71 $\frac{6}{7}$	0.5		1	Cloudy	Some hail in the afternoon, with
9	74	80	75				2	—	thunder.
10	75	80	74				2	—	A great appearance of rain; v
11	71	77	75				1	—	dark.
12	73	79	76			NW	1	—	Ditto; few drops of rain.
13	73	80	74			S	3	—	—
14	74	80	75			NW	2	—	—
15	70	82	72	New M. 70 $\frac{3}{7}$	0.5		1	—	Much thunder this morning, v
16	72	78	74			S	2	—	a heavy shower.
17	70	81	72				0	Clear	—
18	69	76	72			var.	1	Hazy	—
19	69	79	74			S	0	—	A few drops of rain.
20	70	77	75			W	2	—	—
21	73	77	74				1	Cloudy	Very gloomy, and a great app
22	70	75	73	F. Q. 67 $\frac{2}{7}$	1.	N	0	Hazy	ance of rain, very close, no
23	70	83	75			W	0	—	all day.
24	72	84	74				0	Cloudy	Ditto.
25	71	76	73				1	—	Clear at intervals.
26	68	70	68				0	—	Ditto.
27	67	74	69			NW	0	—	Very thick.
28	67	79	71			W	1	—	Thunder, very moist and wet.
29	66	78	71			NW	2	Clear	Very chilly.
mean	72	79	73		4.2	var.	2	Cloudy	Mean state of the atmosphere.

*A General State of the Weather for March.*

	M.	N.	E.	
Greatest altitude of Thermometer,	84	89	85	} 79½ Mean temperature.
Least ditto, - - -	66	75	71	
Mean — - - - -	75	84	79	
Clear, - - -	16	days.		
Cloudy, - - -	15	—		
Rain, - - -	3	—		
Quantity of do.	1-8	inch.		

THE wind almost continually southerly, and strong blasts towards the end of the month; the weather throughout clear and serene, and heavy dews at night, which indeed must always be the case when they are preceded by a clear warm sun.

IN blowing weather dews are seldom seen, the moisture as it falls being dispelled by the wind.

THE heat of the earth this month, about mid-day, about 120°.

## Calcutta, March 1784.

Day.	Thermom.			Mean morning heat at each quarter of the Moon.	Rain Inch	Wind.		Appearance of the air.	REMARKS.
	M.	N.	E.			Point	Force		
1	66	80	71	Full M. $70 \frac{5}{7}$	1	SW	1	Clear	MONDAY.
2	67	80	71			W	1	ditto	Moist.
3	70	82	76			S	2	ditto	Thunder, but no rain.
4	72	85	76			W	4	Cloudy	Thunder early this morning.
5	73	84	74			SE	0	Hazy	
6	71	83	74				2	Cloudy	
7	70	78	74				1	ditto	Great appearance of rain.
8	69	75	74	L. Q. $71 \frac{6}{7}$	var.	S	1	Clear	
9	70	80	74				1	ditto	The weather very fine and dry.
10	70	82	75				0	ditto	Ditto.
11	70	83	75				2	ditto	Ditto.
12	69	85	75				1	ditto	Ditto.
13	70	88	79			S	3	ditto	Ditto.
14	75	86	81				1	ditto	The morning foggy.
15	76	86	80	New M. $70 \frac{3}{7}$	0.3		0	Cloudy	Very close and sultry.
16	79	86	81				0	Clear	Ditto.
17	78	86	81				0	ditto	Ditto.
18	79	87	83			var.	0	Hazy	Ditto.
19	80	88	83				3	Clear	The wind high.
20	80	86	82				3	Cloudy	Ditto thunder.
21	77	85	83			W	5	ditto	Ditto.
22	80	86	83	F. Q. $67 \frac{3}{7}$	0.5	S	2	Clear	
23	80	88	84				0	Cloudy	Moist.
24	80	89	83				1	ditto	Do.
25	81	88	85				1	ditto	Very thick.
26	83	89	84			var.	1	ditto	A great appearance of rain.
27	84	86	80			S	4	ditto	The wind boisterous.
28	77	82	81				3	ditto	Ditto.
29	78	81	81				2	ditto	Ditto.
30	79	86	83				1	Clear	
31	80	84	81				1	ditto	
mean	75	84	79		1.8	S	3	Clear.	Mean state of the atmosphere.

*A General State of the Weather for April.*

	M.	N.	E.	
Greatest altitude of the Thermometer, -	86	97	87	} 86½ Mean temperature.
Least ditto, - - -	71	87	79	
Mean ditto, - - -	83	91	85	
Clear, -	14 days.			
Cloudy, -	16 do.			
Rain, -	6 do.			
Quantity of rain,	3.1 inch.			

THE prevailing wind this month, as well as the former, South ; the mean heat of the earth at mid-day 126°. Blowing and heavy weather in general, and frequent thunder-storms about the end, although many of the nights were close and sultry.

THE thunder-storms that generally prevail at this time of the year, always happen in the afternoon or evening, and come from the NW, and are attended with loud peals and heavy fall of rain. Before these storms begin, the clouds become very dark and low ; and the winds being thus confined between the clouds and earth, must of course be greatly augmented.

*Calcutta,*

Calcutta, April, 1784.

Day.	Thermom.			Mean morning heat at each quarter of the Moon.	Rain Inch.	Wind.		Appearance of the air.	REMARKS
	M.	N.	E.			Point.	Force.		
1	79	89	85	Full M. $82 \frac{6}{7}$		S	1	Clear	THURSDAY.
2	81	87	83				0	ditto	
3	81	91	85				4	Cloudy	Disagreeable blowing weather.
4	83	89	85				3	ditto	Ditto.
5	83	89	86				3	ditto	Ditto.
6	83	88	85				4	Cloudy	Ditto.
7	83	91	86				3	Hazy	Ditto.
8	83	91	85	L. Q. $14 \frac{3}{7}$			2	Clear	
9	84	92	86				1	ditto	
10	84	94	87				0	ditto	
11	85	97	87				0	ditto	The night very close.
12	86	95	87				0	ditto	Ditto.
13	85	93	85				0	ditto	
14	86	92	83			SE	3	ditto	Hard blowing weather, with much
15	83	91	85	New M. $81 \frac{1}{7}$	0.4	S	3	Cloudy	dust.
16	83	90	86				3	ditto	Ditto.
17	84	89	80				4	ditto	A heavy thunder-storm in the
18	80	88	79			SW	2	ditto	evening.
19	74	77	85			NW	3	ditto	High wind.
20	83	90	85			S	0	Clear	Very close.
21	83	91	86				3	ditto	Strong wind.
22	83	92	85	F. Q. $83 \frac{5}{7}$	0.2		3	ditto	Ditto.
23	83	93	87				3	Hazy	And close and fultry.
24	83	92	86				3	Clear	
25	84	90	86				3	ditto	
26	84	89	84				4	Cloudy	With rain and thunder.
27	80	88	85				4	ditto	Ditto from NW.
28	83	90	86				2	ditto	Ditto. Ditto.
29	85	88	85		0.1		0	ditto	Ditto.
30	84	89	85				3	ditto	High wind.
mean	83	91	85		3.1	S	4	Cloudy	Mean state of the atmosphere.



*A General State of the Weather for May.*

		M.	N.	E.	
Greatest altitude of the Thermometer,		85	93	88	} 84½ Mean temperature.
Least ditto,	-	75	82	74	
Mean ditto,	-	81	89	84	
	Clear,	-	7	days.	
	Cloudy,	-	24	do.	
	Rain,	-	14	do.	
	Quantity of do.		9-6	inches.	

THE wind southerly, with a few pretty violent storms from the NW, at the beginning of the month, while the latter part was close, gloomy, and warm; but in general the whole month was exceedingly cloudy, and scarcely a single day of bright sunshine.

THE rains began on the 22d, and from that day to the end; the nights were very close and sultry, and the air very damp.

*Calcutta,*

## Calcutta, May, 1784.

Day.	Thermom.			Mean morning heat at each quarter of the Moon.	Rain Inch.	Wind.		Appearance of the air.	REMARKS.
	M.	N.	E.			Point	Force		
1	82	86	82	Full M. 79 $\frac{6}{7}$	2.	S	3	Cloudy	SATURDAY, a violent storm.
2	77	88	74		1.		3	ditto	Very heavy. Do. no sun.
3	75	82	79		0.6		4	ditto	Ditto.
4	78	87	84				1	Hazy	And clofe.
5	82	89	84				1	ditto	No sun all day.
6	81	90	85		0.5		2	ditto	A thunder storm in the evening.
7	84	90	85				3	ditto	High wind at times.
8	82	90	86				3	Clear	Ditto
9	83	90	87	L. Q. 79 $\frac{6}{7}$			2	Hazy	
10	84	90	87		0.4	SE	3	Cloudy	Very thick and dark.
11	85	89	78				2	ditto	
12	75	88	84		0.8	E	2	ditto	A thunder storm in the evening.
13	77	85	80		2.	S	1	ditto	
14	75	85	83			var.	0	ditto	No wind.
15	80	88	84			S	0	Clear	
16	80	90	83				1	ditto	Thunder in the evening.
17	78	91	86	New M. 82 $\frac{6}{7}$	0.2		0	ditto	The weather very clofe and full.
18	83	91	87				0	ditto	Ditto
19	84	90	87				1	ditto	Ditto
20	85	92	87				1	Cloudy	At intervals.
21	85	93	88				0	Clear	Very full.
22	85	91	85		0.6		2	Cloudy	Thunder in the evening.
23	84	90	83		0.4		2	ditto	Ditto.
24	82	89	85				2	ditto	Ditto.
25	83	92	86	F. Q. 81 $\frac{6}{7}$	0.2		1	ditto	Ditto.
26	84	86	84		0.1		2	ditto	Ditto.
27	81	82	83		0.2	SE	2	ditto	Ditto.
28	80	86	83			NW	3	ditto	A great appearance of rain.
29	81	89	84		0.4	NW	2	ditto	The nights very sultry.
30	82	89	85			NW	1	ditto	Ditto.
31	82	92	86		0.2	S	2	ditto	Thunder do.
mean	81	89	84		9.6	S	2	Cloudy	Mean state of the atmosphere.

*A General State of the Weather for June.*

	M.	N.	E.	
Greatest altitude of Thermometer	84	90	86	} 83 Mean temperature.
Least do. - - -	77	80	78	
Mean do. - - -	81	85	83	

Clear, - 1 days.  
 Cloudy - 29 do.  
 Rain - 14 do.  
 Quantity of do. 17.4 inches.

THE wind this month inclining sometimes to the E of S. The atmosphere exceedingly moist and wet, and much rain from the 10th to 17th, the sky mostly clouded throughout, and very little variation in the temperature of the air.

Calcutta, June, 1784.

Day.	Thermom.			Mean morning heat at each quarter of the Moon.	Rain Inches	Wind.		Appearance of the air.	REMARKS		
	M.	N.	E.			Point	Force				
1	82	82	82	Full M. $79\frac{3}{7}$	0.7	S	1	Cloudy	TUESDAY, thunder.		
2	80	86	84		1.2		1	ditto			
3	82	84	83		0.2	var.	1	ditto	A gentle shower. Close.		
4	82	85	82				1	ditto			
5	81	87	85				0	ditto			
6	82	90	85	L. Q. $79\frac{1}{7}$	0.5	NE	0	ditto	Several showers.		
7	83	85	84				1	ditto			
8	81	84	82		1.6		1	ditto	No sun all day. Incessant rain all day. Ditto		
9	80	84	83		1.1		0	ditto			
10	81	83	82		1.6		S	1		ditto	
11	79	80	80	New M. $82\frac{1}{7}$	4.6	S	3	ditto	Thunder in the evening. No sun all day.		
12	78	78	78		0.1		1	ditto			
13	77	80	80		0.4		2	ditto			
14	80	85	80		0.1	W	2	Hazy	Ditto Ditto Ditto.		
15	81	85	82				1	Cloudy			
16	80	82	79		2.5	var.	1	ditto		Sun very faint. Very thick, and no sun. The nights very close. Ditto. Ditto. Ditto. Ditto.	
17	80	83	83	0.8	S		0	ditto			
18	81	89	85	F. Q. 82	SE	1	Hazy				
19	81	88	85			1	ditto				
20	82	88	86			1	ditto				
21	84	90	85			1	ditto				
22	84	88	85			var.	1	ditto	Ditto. Ditto. Ditto. Ditto.		
23	82	88	85	1			ditto				
24	82	90	84	1			ditto				
25	83	90	86	0			Cloudy				
26	83	89	84		S	0	Hazy	Ditto. Ditto.			
27	82	87	84						0	Cloudy	
28	83	87	83						0	Cloudy	
29	81	81	81			2.1	var.		1	ditto	Thunder. High wind
30	81	88	83	S	3			Clear			
mean	81	85	83		17.4	S&SE	1	Cloudy	Mean state of the atmosphere.		

*A General State of the Weather for July.*

	M.	N.	E.	
Greatest altitude of Thermometer	84	90	85	} 83 Mean temperature.
Last ditto - - -	77	77	78	
Mean ditto - - -	81	85	83	
Clear - - -	-	1	days.	
Cloudy - - -	-	30	do.	
Rain - - -	-	20	do.	
Quantity of do. -	-	15	inches.	

THE prevailing wind SE, and the atmosphere as the former month, exceedingly thick and humid, and very little sun-shine. The mean temperature exactly the same as last month, and very little variation between the heat at mid-day and that of the morning and evening.

DURING the rains the wind is often variable, but commonly it comes round to the eastward, when there falls much rain.

## Calcutta, July, 1784.

Day.	Thermom.			Mean morning heat at each quar- ter of the Moon	Rain Inch.	Wind.		Appear- ance of the air.	REMARKS	
	M.	N.	E.			Point	Force.			
1	81	89	84	THURSDAY.		S	3	Clear	The wind strong in the morning, but the nights very still and close.	
2	83	88	84			SE	2	Cloudy		
3	83	83	83				2	ditto		
4	80	86	84				3	ditto		
5	84	89	84	Full M. 82	0.4		2	Hazy	The night very bright Ditto thunder.	
6	84	88	84				1	Cloudy		
7	83	85	84				0	ditto		
8	82	85	84				0	ditto		
9	82	86	84	L. Q. 82 $\frac{7}{7}$	0.1	var.	1	ditto	Ditto. Much lightning in the evening.	
10	82	90	85				1	ditto		
11	83	86	83				1	ditto		
12	82	86	84				1	ditto		
13	83	86	84		0.9		2	ditto	Several small showers.	
14	81	84	82				1	ditto		
15	79	83	82			SE	1	ditto		
16	82	83	82				0	ditto		
17	78	83	82	New M. 79 $\frac{5}{7}$	0.9		1	ditto	Small rain, very dark. On the 7th there had been no rain at Chunar, many persons sick, but chiefly among the natives.	
18	79	85	82				2	ditto		
19	79	84	82				1	ditto		
20	80	85	80				3	ditto		
21	77	83	80		0.1	S SE	1	ditto	Much thunder and lightning.	
22	79	84	82				1	ditto		
23	80	85	79				0	ditto		
24	79	83	80				1	ditto		
25	79	83	81	F. Q. 79 $\frac{6}{7}$	0.1	E SE	1	ditto	Thunder.	
26	80	86	82				1	ditto		
27	81	86	83				1	ditto		
28	81	86	84				1	ditto		
29	83	86	83		1.8	SW S SW	3	ditto	High winds Thunder. Rain all day.	
30	81	82	79				1	ditto		
31	78	77	78				1	ditto		
mean	81	85	83		15.	S&SE	1	Cloudy	Mean state of the atmosphere.	

*A General State of the Weather for August.*

		M	N	E	
THERMOMETER,	Greatest altitude,	83°	89°	84°	} 82 $\frac{1}{2}$ Mean temperature.
	Least do. -	77	80	80	
	Mean do. -	81	85	82	
BAROMETER,	Greatest do. in.	29.75	29.75	29.76	} Mean state of the atmosphere.— 29.57.
	Least do. -	29.57	29.56	29.61	
	Mean do. -	29.67	29.67	29.70	
	Greatest variation,	.18	.18	.15	
	Mean density,	.688	.682	.688	
HYGROMETER,	Greatest moisture,	50°	45°	45°	} .686 density.
	Ditto drought,	15	10	10	
	Mean drought & moist.	3d 28m	1d 18m	1d 15m	
	Clear -	5 days.			
	Cloudy -	26 do.			
	Rain -	23 do.			
	Quantity do.	16.9 inches.			

THE air still very moist, and very little sun-shine, although the nights in general were very bright and fine: frequently thunder, and on the 22d, an exceeding loud peal early in the morning. The quantity of rain that fell this month was very considerable, and every thing imbibing the moisture to the highest degree.

THE Barometer is almost invariably higher at night than in the morning, and lowest always at mid-day. The air being much loaded with moisture the whole of this month, the variation of the mercury was very insensible. The same causes kept the Thermometer nearly stationary also.

Calcutta, August, 1784.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain	Wind and Force.				
	M	N.	E.		M	N.	E.	M		N		E.			Point.	M	N.	E.	
								d	m	d	m	d	m						
1	77	83	80	F. M. SUN- DAY.	29.64	29.64	29.73	10	15	10				1.2	S	0	1	0	Cloudy
2	80	86	82		.69	.69	.73	15	15	5				0.4		0	1	0	ditto
3	81	86	83		.70	.63	.70	15	20		20					1	1	1	ditto
4	82	88	83	L. Q 687	.66	.64	.66	15	25		20			0.4	SE	0	1	0	Clear
5	82	86	83		.64	.63	.71	15	30		15			0.3	E	1	1	0	Cloudy
6	81	86	83		.70	.70	.75	12	30	0	0			0.1	SE	1	1	1	ditto
7	82	86	83		.75	.70	.74	10	40		5			C.2		0	1	0	ditto
8	81	89	84		.74	.72	.72	10	35		10				S	1	2	1	Clear
9	82	87	83		.70	.70	.73	15	35		30					0	1	0	ditto
10	82	87	83		.73	.73	.75	40	40		30					1	0	1	ditto
11	83	82	83		.72	.72	.73	40	40		40			0.4		1	2	0	Cloudy
12	82	83	81		.70	.72	.74	45	2		8			0.7	SE	1	2	0	ditto
13	81	87	83		.72	.72	.76	15	10		10					0	1	1	ditto
14	81	83	81	N. M. 689	.73	.73	.77	20		20	10			0.8		1	1	0	ditto
15	81	83	81		.74	.72	.74	10	35		25			0.7	S	0	0	0	ditto
16	79	84	82		.70	.60	.64	40	35		25			1.5	SE	1	0	0	ditto
17	81	83	80		.60	.56	.61	25	40		30			2.5		1	1	0	ditto
18	79	83	80		.58	.56	.64	45	30		40			2.8		0	2	1	ditto
19	77	80	80		.65	.69	.74	45	45		30			0.8		1	1	1	ditto
20	78	84	81		.74	.75	.72	40	35		45			0.5		1	2	2	ditto
21	79	87	83		.72	.63	.69	50	15		35				SW	0	1	0	Clear
22	80	86	83		.65	.64	.69	45	25		12			1.9		2	0	0	Hazy
23	82	87	83	F. Q. 689	.67	.61	.67	30	0		20			0.2	S	0	0	0	Cloudy
24	82	87	84		.64	.59	.66	30	0	0	5				SE	0	1	0	ditto
25	83	86	84	F. M. 688	.64	.64	.64	15	8		5			0.2	E	0	1	1	ditto
26	81	85	81		.60	.56	.63	10		5	10			0.3	SE	2	2	1	ditto
27	80	84	81		.60	.59	.62	8		5	6			0.1		2	3	2	ditto
28	80	85	83		.59	.64	.65	10		15	20			0.2		2	3	2	ditto
29	81	87	83		.64	.68	.68	33	0	0	6			0.6	SW	3	3	3	ditto
30	81	85	83		.66	.66	.69	20		15	10				SW	2	2	2	ditto
31	80	84	83		.66	.69	.74	25		25	35			0.1	S	2	2	1	ditto
mean	81	85	82		29.67	29.66	29.70	3	28	1	18	1	15	16.9	S&SE	1	1	1	Cloudy



*A General State of the Weather for September.*

	M.	N.	E.	
<b>THERMOMETER,</b> Greatest altitude	84°	90°	85°	82 $\frac{1}{2}$ mean temperature.
Least do. -	76	77	78	
Mean do. -	80	85	81 $\frac{1}{2}$	
<b>BAROMETER,</b> Greatest do. in.	29.95	29.90	29.97	Mean state of the atmosphere, 29.81.
Least do. -	29.72	29.68	29.75	
Mean do. -	29.81	29.80	29.83	
Greatest variation	0.23	0.22	0.22	.690 density.
Mean density	.693	.685	.692	
<b>HYGROMETER,</b> Greatest moisture	60°	60°	60°	
Ditto drought	10	40	25	}
Mean density & moist.	$\frac{1}{2}$ d 24m	10d 14m	5d 15m	
Clear -	-	10 days.		
Cloudy -	-	20 do.		
Rain -	-	12 do.		
Quantity of do.		11.3 inches.		

THE wind generally S and SE, much lightning in the evenings, but not attended either with rain or thunder. The air still damp and cloudy, although the Barometer stood considerably higher than the preceding month.

It is worthy of observation, that upon the rains going off, the water falls in larger drops than at any other period of the season, and probably this may be occasioned from the height it has to fall: and in proof of this, the opposite stations of the barometer need only be consulted, where it appeared that the weight of the atmosphere was greatly increased about the last period of the rains.

Calcutta, September, 1784.

Day.	Thermom.			Moon's mean density each quarter.	Barometer			Hygrometer.						Rain.	Wind and Force.				
	M	N	E.		M.	N.	E.	M.		N.		E.	Point.		V	N	F		
								d	m	d	m							d	m
1	81	80	83	WED.	29.72	29.72	29.79	40		5		20		2.0	S	0	1	Cloudy	
2	81	80	84		.79	.82	.84	25		5		5			SE	0	1	Clear	
3	83	83	82		.84	.81	.84	25		20		25			SW	0	1	Cloudy	
4	81	87	83	L. Q. 691	.82	.78	.76	35		20		15		0.5		1	1	Hazy	
5	81	88	83		.74	.78	.75	30		20		20				1	1	ditto	
6	82	80	83		.75	.77	.78	20		20		5				0	1	Cloudy	
7	81	80	83		.77	.82	.81	25	15	0		20			S	1	1	Clear	
8	81	88	83		.80	.83	.80	15	12		10				S	0	1	ditto	
9	82	80	84		.79	.72	.78	5	30		5				SW	0	2	ditto	
10	82	90	83	New M 691	.76	.72	.78	5	55		20			0.7	SE	0	1	ditto	
11	84	90	85		.78	.78	.81	10	40		25				NE	0	2	ditto	
12	84	87	84		.81	.80	.79	0	20		20					0	1	Cloudy.	
13	81	87	83		.77	.75	.76	25	20		20				N	1	1	Heavy	
14	82	84	82		.72	.68	.78	15	10		10				NE	1	1	ditto	
15	77	82	80		.77	.80	.80	15	0	0	0				SE	1	1	ditto	
16	79	81	81	Full Q. 698	.78	.80	.76	20		5		15		1.6		1	1	ditto	
17	79	80	79		.93	.78	.78	18		25		30	1.5			1	2	ditto	
18	77	81	78		.79	.77	.84	5		38		38	0.9			0	1	ditto	
19	76	77	78		.84	.80	.87	50		55		55	1.2				1	1	ditto
20	78	80	74		.88	.89	.91	60		60		55	1.1		SE	1	0	ditto	
21	78	80	78		.92	.89	.95	60		55		60	0.3		E	1	1	ditto	
22	79	80	80	Full M 694	.95	.90	.97	60		45		45	1.1	1.6	SE	0	1	ditto	
23	78	83	80		.94	.88	.92	45		30		35	0.1		S	0	1	ditto	
24	79	84	80		.92	.84	.88	40		20		30			S	0	1	ditto	
25	79	85	80		.88	.84	.86	35		0		5			SE	0	1	ditto	
26	78	86	82		.87	.84	.86	20		20		5			SE	0	1	Clear	
27	80	83	79		.80	.84	.80	5		0		5			var.	0	2	Cloudy	
28	79	85	82		.80	.77	.83	15		20		5			S	0	2	Clear	
29	80	88	84		.84	.81	.89	10		35		20			SE	0	1	ditto	
30	83	89	81		.89	.87	.93	5		35		15				0	1	ditto	
Mean	80	85	81½		29.81	29.80	29.83	24	10	14	5	15	11.3	SE&S	½	1	½	Cloudy	

*A General State of the Weather for October.*

		M	N	E	
THERMOMETER,	Greatest altitude	83	90	85	82½ mean temperature.
	Least do. -	74	77	76	
	Mean do. -	79	86½	82½	
BAROMETER,	Greatest do. in.	30.04	30.00	30.02	Mean state of the atmosphere. — 29.91.
	Least do. -	29.74	29.77	29.76	
	Mean do. -	29.92	29.91	29.92	
	Greatest variation	0.30	0.23	0.26	
	Mean density	.697	.686	.693	
HYGROMETER,	Greatest moisture	48	25	30	.692 density.
	Ditto drought	30	50	45	
	Mean moist & drought	5d 7m	30d 1m	22d 2m	
	Clear	-	19 days.		
	Cloudy	-	12 do.		
	Rain	-	3 do.		
	Quantity of do.	-	0.8 inches.		

THE air very clear and elastic, and heavy dews at night. The Barometer very high, and the wind W and NW.

ABOUT the middle of the month the mornings became a little foggy, which indicates the approach, or beginning, of the cold season: The atmosphere thin and dry, and cleared of its vapours; of course the mercury rose in the Barometer.

As the difference between the day and the night - heat begins now to be greater than in any of the eight preceding months, the fogs we have at this season of the year are by that means formed.

Calcutta, October, 1784.

Day.	Thermom.			Moon's mean density each quarter.	Barometer			Hygrometer.						Rain.	Wind and Force				
	M.	N	E.		M.	N.	E.	M		N.		E.			Point.	M	N	E	
								d	m	d	m	d	m.						
1	83	89	82	FRID.  L. Q. 692	29.91	29.93	29.93	3		35		10		0.6	SE	0	3	1	Cloudy
2	81	82	80		.94	.90	.92			15		0		0.1	S	1	3	1	ditto
3	80	85	83		.90	.83	.87			15		5			SE	0	1	1	ditto
4	80	88	84		.83	.77	.86			15		25			S	0	2	0	ditto
5	82	88	84		.78	.78	.78			5		25			NE	0	3	0	ditto
6	81	90	83		.76	.78	.76			0		20		0.1	var.	0	1	1	Clear
7	82	87	82		.74	.77	.77	5		20		15				0	1	1	ditto
8	82	88	83		.77	.77	.83	5		40		35			W	0	1	0	Cloudy
9	80	89	82		.83	.87	.86	10		40		35			W	1	1	0	Clear
10	79	89	82		.88	.87	.86	15		40		35				0	1	0	ditto
11	99	90	83	N. M. 696	30.03	.96	30.	15		40		30				0	1	1	ditto
12	81	88	85		29.98	.94	29.97	25		25		15				0	2	0	ditto
13	81	89	85		.99	.92	.94	10		25		15				0	1	1	ditto
14	80	89	84		.93	.89	.92	30		30		15				1	1	0	ditto
15	80	87	82		.92	.92	.91	10		40		20				0	1	0	ditto
16	79	89	83		.91	.93	.93	10		35		30			SW	0	1	0	ditto
17	78	88	83		.94	30.	.94	0		35		30			SW	0	1	0	ditto
18	80	87	83		.94	29.97	.96	0		35		30			W	0	1	0	ditto
19	80	89	83		30.02	.98	30.01	0		40		25			NW	0	1	0	ditto
20	77	88	82		.04	.98	29.98	10		45		30				0	1	0	ditto
21	78	88	82	F. Q. 702	29.98	.96	.99	20		50		45				0	1	0	ditto
22	78	87	83		30.	.99	.98	30		50		40				0	1	0	Cloudy
23	77	80	76		29.95	.94	.93	10		0			30	0.05		1	2	1	ditto
24	75	77	76		.88	.89	.92	40		75		25			N	3	3	0	ditto
25	74	84	79		.92	.88	.93	35		5		5			NW	1	1	0	ditto
26	76	83	80		.93	.90	.92	20		15		10				1	1	0	ditto
27	76	86	80		.92	.89	.94	5		30		20				1	1	1	ditto
28	75	86	80		.94	.94	.99	0		40		35				1	1	0	Clear
29	76	83	80		.99	30.	.99	10		35		30				0	1	0	ditto
30	75	85	80		.98	29.95	30.	10		40		40				0	2	0	ditto
31	75	85	80		30.	30.	30.02	20		45		40				0	1	0	ditto
mean	79	86½	82½		29.29	29.91	29.92	5	7	30	1	22	2	0.6	WNW	½	1½	½	Clear.

*A General State of the Weather for November.*

		M.	N.	E.	
THERMOMETER,	Greatest altitude	78°	86	80	} 76 mean temperature.
	Least do. -	66	76	71	
	Mean do. -	71½	80½	75½	
BAROMETER,	Greatest do. in.	30.12	30.05	30.08	} 30.00 mean state of atmosphere.
	Least do. -	29.60	29.88	29.92	
	Mean do. -	30.00	29.99	30.02	
	Greatest variation	00.52	00.17	00.16	
	Mean density	.712	.696	.706	
HYGROMETER,	Greatest moisture	40	15	15	} 702 density.
	Ditto drought	45	55	50	
	Mean moist & drought	8m 10d	½m 35d	1m 28d	
	Clear	-	23 days.		
	Cloudy	-	7 do.		
	Rain	-	1 do.		
	Quantity of rain		0.9 inches.		

THE NW winds prevailed this month, but nothing remarkable in the changes of the atmosphere, although there were several appearances of rain in the course of it. The air more elastic than any of the former months, also more serene and dry. The foggy mornings still keep off.

IN clear dry weather there is always a very sensible change on the barometer two or three hours after sun-rising; it being often near  $\frac{1}{16}$  of an inch higher about nine o'clock than at six or sun-rise. May not this be owing to the load of vapour condensed and kept near the surface of the earth, from the coldness of the night, which, as it is gradually rarefied by the heat of the sun, must increase the weight and spring of the atmosphere, and produce this variation? From hence, the barometer is always higher in the evening, before these watery particles fall, than in the morning when the air is replete.

*Calcutta,*

Calcutta, November, 1784.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	F.	M.		N.		E.			Point.	M	N	E	
								d	m	d	m	d	m						
1	74	85	80	MON.  L. Q. 705	30.02	29.99	30.03	20	1	45		35			NW	0	1	0	Clear
2	77	85	80		.05	.96	.00	15		40		30				0	1	0	Cloudy
3	77	86	80		.00	.98	.02	10		40		30				0	1	0	Clear
4	76	85	80		.02	30.00	.03	0		35		35				0	2	0	Cloudy
5	78	85	79		.00	29.97	.02	5		40		35				0	1	0	Clear
6	76	84	80		.00	30.00	.02	0		40		35				1	2	0	ditto
7	76	86	79		.02	.02	.02	20		45		45				0	2	1	ditto
8	73	82	78		.02	.02	.00	35		50		50				0	1	0	ditto
9	72	83	76	N. M. 707	.02	.02	.06	45		55		50			1	1	0	ditto	
10	72	81	78		.10	.08	.08	35		50		45			1	1	0	Cloudy	
11	74	76	76		.12	.05	.07	15		0		35			0	2	0	ditto	
12	75	79	76		.07	.04	.05		40		15	15			0	1	0	Clear	
13	71	81	77		.05	29.98	.02		40	30		15			0	1	0	ditto	
14	77	79	75		29.60	.89	29.92		10	25		20			1	1	0	ditto	
15	74	80	75		.94	.95	30.00		20	25		15			0	1	0	ditto	
16	73	81	73		30.01	30.05	.07		20	40		15			0	1	0	ditto	
17	66	80	72		.07	.03	.06		0	50		35			1	2	1	ditto	
18	67	78	74		.04	.02	.04	15		45		40			0	1	1	ditto	
19	68	78	72	F. Q. 718	.03	29.99	.04	10		45		40			1	1	0	ditto	
20	69	78	75		.03	30.02	.05	15		40		35			0	1	0	ditto	
21	69	79	74		.02	29.97	.02	5		40		35			0	1	0	ditto	
22	68	78	73		29.98	.93	29.97	0		0		30			0	0	0	Hazy	
23	69	78	72		.97	.92	.94	0		5	35	15			1	1	0	Clear	
24	70	78	73		.90	.88	.95		35	5					1	1	0	Cloudy	
25	68	78	71		.92	.96	30.02		35		5	5			0	2	0	ditto	
26	67	79	73		30.03	30.03	.04		40	20		20			0	1	0	Clear	
27	67	79	73	F. M. 717	.00	.00	.03	20		35		30			1	1	0	ditto	
28	69	80	75		.00	.00	.03	10		35		30			0	1	0	ditto	
29	67	80	73		.02	29.99	.04	15		45		20			0	1	1	ditto	
30	67	80	73		.05	.04	.08	20		50		30			1	2	1	ditto	
mean	71½	80½	75½		30.00	29.99	30.02	10	8	35	½	28	1	90.	NW	½	1½	½	Clear

*A General State of the Weather for December, 1784.*

	M	N	E	
<b>THERMOMETER,</b> Greatest altitude,	69	79	73	68½
Least do. -	58	68	65	
Mean do. -	63½	74	68½	
<b>BAROMETER,</b> Greatest do. in.	30.17	30.14	30.17	Mean state of the atmosphere, 30°.08
Least do. -	30.02	30.00	30.02	
Mean do. -	30.09	30.07	30.09	
Greatest variation,	00.15	00.14	00.15	.717 M. D.
Mean density,	.727	.709	.721	
<b>HYGROMETER,</b> Mean moist & drought	24 d	48 d.	38 d	
Clear -	26 days.			
Cloudy -	5 do.			
Rain -	1 do.			
Quantity do.	0.05 inches.			

THE winds were constantly NW, except a few days, when it was inclined a little to the E, which always brings on cloudy thick weather. The whole month remarkably dry, and the atmosphere of such a density as greatly to exceed any of the former. At this season of the year there is generally a thick disagreeable fog in the mornings and evenings; however, this month, on the contrary, has been very clear and serene, and but seldom thick fogs at either of these times.

Calcutta, December, 1784.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain	Wind and Force.				
	M.	N	E.		M.	N.	E.	M.		N.		E.			Point.	M	N	E.	
								d	m	d	m	d	m						
1	65	79	72	I. Q. 721	30.07	30.10	30.10	20		45		30		0.05	NE	1	1	1	Cloudy
2	68	76	72		.07	.04	.07	40		50		30				0	1	0	ditto
3	69	78	73		.03	.01	.06	20		40		20				1	1	0	ditto
4	67	78	73		.06	.05	.09	15		30		15			NW	1	2	1	ditto
5	65	79	72		.10	.08	.09	0		45		25				1	2	0	Clear
6	65	75	70		.08	.05	.10	30		50		15				2	3	0	ditto
7	63	75	68	N. M. 728	.08	.03	.05	45		55		45				1	2	1	ditto
8	61	74	68		.07	.04	.09	40		55		45				2	1	0	ditto
9	61	75	69		.07	.06	.07	30		55		45				2	1	0	ditto
10	62	75	68		.08	.06	.07	50		55		40				1	1	0	ditto
11	61	75	68		.07	.04	.08	30		55		45				1	1	0	ditto
12	62	73	68		.09	.03	.08	20		40		35				1	0	0	ditto
13	62	74	69	F. Q. 725	.08	.04	.05	10		40		40				0	1	0	ditto
14	64	71	69		.05	.01	.04	20		35		25			N	0	0	0	Cloudy
15	66	73	68		.04	.07	.08	20		40		35			NNW	1	1	0	ditto
16	64	75	70		.09	.06	.08	30		45		40			NW	0	1	0	Clear
17	67	75	70		.07	.01	.02	30		40		30				0	1	0	ditto
18	66	76	72		.02	.00	.07	10		40		25			NE	0	2	0	ditto
19	67	75	71	F. M. 732	.06	.06	.07	0		50		25			W	0	1	0	ditto
20	66	75	66		.06	.05	.08	25		55		40			NW	0	1	0	ditto
21	65	74	67		.11	.10	.13	35		00		50				0	1	0	ditto
22	61	71	65		.17	.13	.17	45		50		50				0	2	0	ditto
23	58	71	65		.17	.12	.14	35		45		40				1	1	0	ditto
24	60	72	66		.14	.13	.14	10		50		40				1	1	0	ditto
25	60	72	68		.15	.14	.16	15		45		45				0	1	0	ditto
26	61	73	68		.17	.14	.14	5		45		35				1	2	0	ditto
27	61	73	68		.15	.13	.14	15		50		40				1	2	0	ditto
28	60	72	67		.14	.10	.13	20		55		40				1	1	0	ditto
29	60	70	65		.10	.10	.10	30		55		45				0	1	0	ditto
30	60	69	65		.10	.06	.07	40		55		45				0	1	0	ditto
31	60	68	65		.08	.05	.06	40		55		45			NW	0	1	0	ditto
Mean	63½	74	68½		30.09	30.07	30.09	24		48		38		0.05		3	12	10	



*A General State of the Weather for January, 1785.*

	M.	N.	F.	
<b>THERMOMETER,</b> Greatest altitude	70	78	74	} M. h. 66
Least do. -	57	69	64	
Mean do. -	61	72	66½	
<b>BAROMETER,</b> Greatest do. in.	30.17	30.14	30.17	} Mean state of the atmosphere, 30.08.
Least do. -	29.98	29.97	30.03	
Mean do. -	30.08	30.07	30.09	
Greatest variation	00.19	00.17	00.14	
Mean density	.732	.712	.723	} 72½ M. D.
<b>HYGROMETER,</b> Mean moist & drought	30 d.	50 d.	40 d.	

Clear - 29 days.

Cloudy - 2 do.

THE atmosphere very dry and elastic.

THE winds variable; but from the middle of the month were almost constantly from the SW and S, and often pretty strong.

THE mercury in the Barometer stood very high till about the end of the month, when a very sensible change took place, both with regard to the warmth and serenity of the weather. Frequent heavy dews about the same time.

THE mornings always very foggy.

THE medium heat of the sun at mid-day (the instrument being exposed five minutes) was 90°.

Calcutta, January, 1785.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain.	Wind & Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	F.	
								d.	m.	d.	m.	d.	m.						
1	60	69	74	L. Q. 73 <sup>2</sup>	30.09	30.09	30.09	30	50	45					NW	0	1	0	Clear
2	57	69	64		.09	.09	.11	40	50	45					NW	0	1	0	ditto
3	50	71	65		.11	.06	.07	25	45	40					WNW	0	1	0	ditto
4	59	69	65		.04	.04	.09	30	50	40						0	1	0	ditto
5	63	70	66		.10	.08	.08	35	50	40						0	2	0	ditto
6	64	70	66		.07	.08	.12	30	50	40					W	0	2	0	ditto
7	63	72	67		.13	.13	.17	35	55	50					NW	0	2	0	ditto
8	59	72	67		.14	.13	.10	35	60	50					N	1	2	0	ditto
9	58	73	65		.10	.09	.09	35	60	45					NW	1	2	0	ditto
10	60	70	65		.10	.10	.14	40	60	50						1	2	1	ditto
11	58	72	65	N. M. 73 <sup>6</sup>	.13	.10	.12	35	60	50						1	2	1	ditto
12	59	72	65		.11	.11	.11	25	50	45					N	1	2	0	ditto
13	60	72	66		.11	.11	.12	30	50	45					NW	2	1	0	ditto
14	60	73	67		.12	.11	.13	40	45	45						0	1	0	ditto
15	58	71	65		.14	.14	.14	35	50	50						1	2	0	ditto
16	60	70	65		.15	.15	.17	40	55	50						0	2	0	ditto
17	60	69	65		.17	.13	.10	45	55	50					N	1	1	0	ditto
18	59	70	65		.10	.10	.06	40	55	50					NW	1	2	0	ditto
19	60	70	65		.08	.05	.05	40	60	50						0	2	0	ditto
20	58	71	65		.05	.05	.05	30	55	50						0	1	0	ditto
21	64	74	67	F. Q. 73 <sup>6</sup>	.02	.00	.07	0	40	30					SW	0	1	0	ditto
22	60	71	65		.08	.05	.08	40	55	50					W	1	2	0	ditto
23	59	70	65		.04	.04	.05	40	60	55					SW	1	2	0	ditto
24	62	70	66		.06	.04	.05	40	55	50					W	0	2	0	ditto
25	62	75	68		.08	.06	.07	40	55	45						0	1	0	ditto
26	63	74	69		.07	.01	.03	30	45	30					SW	0	2	0	ditto
27	68	74	70		29.98	29.97	.03	15	40	30					S	0	2	0	ditto
28	67	76	69		30.01	.98	.04	10	55				10		SW	1	2	0	ditto
29	65	77	74		.02	30.01	.05	40	60				50		S	0	3	0	ditto
30	66	76	71		.00	.01	.03	10	40				10			0	3	1	Cloudy
31	70	78	74	.02	.03	.05	40	0				10			0	3	2	ditto	
mean	61 <sup>1</sup>	72	66 <sup>1</sup>		30.08	30.07	30.09	30	1 <sup>1</sup>	50			40	1	var.	<sup>1</sup>	2	<sup>1</sup>	Clear

*A General State of the Weather for February, 1785.*

	N.	M.	E.	
<b>THERMOMETER,</b> Greatest altitude	74	86	76	} 75 mean tempera- ture.
Least do. -	68	75	69	
Mean do. -	71	79½	74	
<b>BAROMETER,</b> Greatest do. in.	30.14	30.17	30.15	} 30.02 mean state of the atmosphere.
Least do. -	29.89	29.89	29.96	
Mean do. -	30.02	30.01	30.04	
Greatest variation	0.25	0.28	0.19	} 706.
Mean density	.713	.698	.708	
<b>HYGROMETER,</b> Moisture and drought	0	28d	22d	

Clear - 17 days.  
 Cloudy - 11 do.  
 Rain - 4 do.  
 Quantity of do. 2-9 inches.

THUNDER five times. Mean heat of the sun at mid-day, the thermometer being exposed five minutes, 96°.

THE beginning of this month the air was very moist, which is generally the case when the wind comes from the S and SE.

ON the contrary, the NW winds which prevailed renders it very dry and elastic, and has always a very great effect in raising the mercury in the barometer. During the whole of this month the mornings were extremely thick and foggy; on the 1st, 8th, and 12th, moderate storms from the NW.

Calcutta, February, 1785.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M		N.		E.			dir.	M.	N	E	
								d.	m	d.	m.	d.	m.						
1	71	77	74	L. Q. 714	30.00	29.90	29.95	50	0	0	40	0.5	S	1	4	1	Cloudy		
2	73	76	71		29.89	.89	.96	40		15		20		SE	1	2	1	ditto	
3	69	77	73		.96	.6	30.03	30	25							0	1	0	Clear
4	72	78	74		30.08	30.07	.12	30		5		30		S	0	1		Cloudy	
5	72	79	75	N. M. 711	.08	.04	.04	4	15			25						Clear	
6	74	80	76		29.98	.03	.05	50	30			20						Cloudy	
7	72	80	72		.98	29.99	.04	45	35			0		SE	1	1	1	Clear	
8	75	80	73		30.05	30.04	.11	30		15		5	0.8	E	0	1	0	ditto	
9	78	78	74	F. Q. 717	.07	.03	.03	35		15		5		W	1	1	0	Cloudy	
10	72	80	75		29.97	29.95	29.98	15	40		30			N	2	1	0	Clear	
11	70	80	74		.98	.99	30.03	10	60		55					1	1	0	ditto
12	73	82	69		30.03	30.03	.12	30		50		40	1.1	NW	0	0	3	Cloudy	
13	69	79	72	F. M. 710	.05	.06	.06	25		45		40						ditto	
14	69	81	74		.01	.00	.04	35		55		50		SW	1	1	0	Clear	
15	70	81	75		.04	.01	.04	30		45		45						ditto	
16	70	75	73		.07	.06	.08	35		55		50		NW	3	3	0	Cloudy	
17	69	80	73	F. M. 710	.06	.02	.05	40		60		55		SW	0	1	1	Clear	
18	70	73	79		.02	.02	.04	35		30								Cloudy	
19	67	75	71		.03	.04	.03		15		15							ditto	
20	69	79	72		.03	.03	.03	10		25		20		NW	0	2	0	Clear	
21	69	77	73	F. M. 710	.04	.04	.04	0		20		25		W	0	2	1	ditto	
22	70	82	75		29.98	29.97	29.97		10		15							ditto	
23	74	84	76		.99	.96	30.00	20		35		45						ditto	
24	72	82	75		30.00	.98	29.98	35		55		45						ditto	
25	72	86	76	F. M. 710	29.96	.96	.97	30		60		55		NW	0	1	0	Cloudy	
26	73	81	76		.96	.96	30.00	50		60		55		NW	1	1	0	Clear	
27	73	83	74		30.03	30.03	.10	50		60		55						ditto	
28	70	81	73		.14	.17	.15	50		60		55						ditto	
mean	71	79½	74		30.02	30.01	30.04	51	15	30	2	28	6	2.9		1½	1½	1	

*A General State of the Weather for March, 1785.*

	M.	N.	E.	
<b>THERMOMETER,</b> Greatest altitude	80°	90°	83°	} 79°
Least do. -	68	80	73	
Mean do. -	75	85	78	
<b>BAROMETER,</b> Greatest do. in.	30.12	30.10	30.13	} 29.95
Least do. -	29.85	29.84	29.86	
Mean do. -	29.95	29.92	29.97	
Greatest variation	.27	.26	.27	} .698
Mean density	.976	.688	.700	
<b>HYGROMETER,</b> Moisture and drought	0.0	36d	18d	
Clear -	-	20 days.		
Cloudy -	-	11 do.		
Rain -	-	3 do.		
Quantity of do.		0.5 inches.		

THUNDER five times. Mean heat of the sun 100°.

THERE were two or three thunder-storms this month, but gentle and attended with very little rain. Several mornings about the beginning were very foggy and damp, and continued so, but in a lesser degree, nearly throughout the month. Heavy dews from the 15th.

THE barometer continued low, which may proceed from the high winds that prevailed, as well as from the extreme rarefaction of the atmosphere at this season of the year. We had often the appearance of rain, as must always be the case while the wind comes from the south quarter, and bringing with it so much vapour.

Calcutta, March, 1785.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain	Wind and Force.				
	M.	N	E.		M	N.	E.	M.		N.		E.			Point.	M	N	E	
								d	m	d	m	d.	m.						
1	68	84	73	L. Q. .713	30.12	30.10	30.13	55		60		60			NW	1	2	0	Clear
2	68	84	73		.10	.07	.08	50		60		55			SW	0	1	0	ditto
3	69	80	74		.05	.04	.07	50		55		50				0	2	1	ditto
4	72	82	75		.04	.03	.06			50		50			SE	1	2	2	ditto
5	73	83	75		.05	.04	.04	5	35	25				*		0	3	1	ditto
6	73	81	76		.03	29.98	.00	5	50	35						0	4	1	ditto
7	73	82	77	N. M. .709	29.97	.99	.04	0	55	40					S	0	4	1	ditto
8	73	82	77		30.02	30.03	.07	20	45	40					SE	0	3	2	Cloudy
9	73	87	77		.06	.04	.07	40	55	40					SW	1	2	0	Clear
10	74	84	74		.05	.02	.05	25	50	45				0.1	SW	0	3	1	Cloudy
11	71	83	76		.02	29.98	.02	40	50	40					SE	0	2	1	Clear
12	74	85	77		29.98	.90	29.93	10	40	15				*		0	2	1	Cloudy
13	75	84	75	F. Q. .702	.90	.84	.89		20	40				0.7	Some hail	1	3	2	Clear
14	71	84	74		.90	.88	.93	35	30	15						0	3	1	Cloudy
15	75	84	74		.90	.85	.93		20	20						1	4	3	ditto
16	73	83	77		.87	.87	.97	10	20	20						3	4	4	ditto
17	77	85	80		.90	.89	.97		10	25						1	1	1	ditto
18	77	86	80		.96	.88	.93	20	21					10	S	0	2	1	Clear
19	77	89	82	F. M. .696	.92	.87	.92	25	50						SE	1	2	1	ditto
20	78	90	83		.86	.85	.88	35	40					10	SW	0	2	2	ditto
21	78	87	81		.86	.84	.87	20	20					10	SE	1	3	1	Cloudy
22	79	86	81		.87	.87	.89	30	10					10	S	1	4	2	ditto
23	79	85	81		.85	.84	.89	30	10					0.1		1	3	4	Clear
24	77	85	80		.87	.85	.89	10	20							1	2	3	ditto
25	78	87	81	F. M. .696	.89	.92	.98	30	35							0	3	2	ditto
26	79	86	81		.96	.91	.91	40	20					10		0	3	3	Cloudy
27	79	88	82		.89	.93	.86	20	20							2	3	1	Clear
28	79	88	82		.85	.87	.92	15	15					5		1	2	3	ditto
29	79	88	83		.90	.87	.92	25	20					5		1	2	2	ditto
30	80	84	82		.95	.87	.90	30	20					20		0	0	0	Cloudy
31	79	88	82		.90	.85		25	60				40			0	1	0	Clear
Mean	75	85	78		29.95	29.92	29.97	13	13	36		20	2	0.5	S	1	3	2	Clear

*A General State of the Weather for April, 1785.*

		M	N	E	
THERMOMETER,	Greatest altitude,	83	91	85	} 82½
	Least do. -	69	75	74	
	Mean do. -	79	86½	82	
BAROMETER,	Greatest do. in.	29.97	29.92	29.97	} 69.83
	Least do. -	29.70	29.68	29.74	
	Mean do. -	29.83	29.81	29.86	
	Greatest variation,	.27	.24	.23	
	Mean density,	.695	.684	.691	
HYGROMETER,	Mean moist & drought	20 m.	20 d.	4 d.	} .690
	Clear -	17 days.			
	Cloudy -	13 do.			
	Rain -	6 do.			
	Quantity do.	8 inches.			

THE quantity of rain that fell on the sixteenth and seventeenth was very considerable, and the variation that appeared on the mercury before and after the thunder-forms was very great; sometimes 00'.30 in the space of a few minutes.

THUNDER six times. Mean heat of the sun 108° to 110°.

THE temperature of the air throughout this month was less warm and sultry than it is generally found at this time of the year; as also the storms that came from the NW were fewer in number. The air rather moist, and little or no variation in the winds, they being always directly S and SE.

Calcutta, April, 1785.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain.	Wind and Force.					
	M.	N	E.		M.	N.	E.	M.		N.		E.			Point.	M	N	E.		
								d	m	d.	m.	d	m.							
1	79	84	80	L. Q. .697	29.90	29.86	29.90	50		55		50				S	0	2	2	Clear
2	75	90	80		.89	.82	.85	25		60		30				0	1	2	ditto	
3	77	90	83		.82	.77	.81			20		30				1	3	2	ditto	
4	77	90	82		.82	.80	.84			10		45		20		0	1	3	ditto	
5	79	88	83		.83	.80	.83					45		30		0	3	1	ditto	
6	79	90	83	N. M. .694	.81	.82	.83					35		25		0	3	3	ditto	
7	78	88	82		.86	.85	.88					20		20		1	4	3	ditto	
8	80	88	81		.88	.83	.84			15		30				0	4	4	Cloudy	
9	80	87	84		.82	.81	.84			30		20		10		2	3	2	Clear	
10	80	87	84		.78	.77	.85			30		40			10	1	4	1	Cloudy	
11	81	88	85	F. Q. .698	.83	.82	.86			25		50		15		1	2	3	ditto	
12	81	88	85		.82	.80	.87			30		10		35		1	0	1	ditto	
13	81	85	84		.82	.86	.89			25		30		35		1	0	0	ditto	
14	83	84	82		.87	.87	.89			10		40		40		1	4	0	ditto	
15	81	84	83		.90	.92	.97	20				30				1	0	1	ditto	
16	78	81	74	F. M. .698	.97	.92	.96	45				40		0	2.4	NW	3	2	4	ditto
17	69	75	75		.86	.79	.83			30		20		50	3.6	NE	3	3	2	ditto
18	77	82	80		.82	.88	.94			60		15		20	0.5	S	0	0	0	Clear
19	79	84	82		.92	.84	.90			40						0	4	0	Cloudy	
20	78	85	81		.85	.79	.93			20						1	2	2	Clear	
21	75	84	80	F. M. .694	.85	.83	.90			10						1	3	2	Cloudy	
22	74	82	80		.85	.84	.87			20		10		10	0.9	SE	1	2	0	Clear
23	79	85	83		.83	.80	.83			40		10		20		1	2	1	Cloudy	
24	81	88	85		.80	.75	.78			40		10		20		1	3	1	Clear	
25	82	89	85		.77	.76	.84			40		20		10		1	2	1	ditto	
26	83	89	81		.76	.77	.87			30		10		10	0.3	S	1	4	4	Cloudy
27	82	89	82		.72	.68	.83			40		20		20	0.3		3	4	4	ditto
28	79	87	83		.70	.75	.74			40		20		30		1	3	3	ditto	
29	82	90	85		.76	.79	.84			50		10		15		0	3	1	ditto	
30	82	91	85		.82	.83	.84			40		10		15		1	3	1	ditto	
mean	79	86½	82		29.83	29.81	29.86	4	24	24	4	12	8	8.0	S	1	3	2	Cloudy	



*A General State of the Weather for May, 1785.*

	M.	N.	E.	
<b>THERMOMETER,</b> Greatest altitude	87	94	89	} 86
Least do. -	79	87	80	
Mean do. -	83	89½	85	
<b>BAROMETER,</b> Greatest do. in.	29.96	29.92	30.03	} 29.77
Least do. -	29.60	29.53	29.63	
Mean do. -	29.77	29.74	29.82	
Greatest variation	.36	.39	.30	
Mean density	.685	.676	.685	} .682
<b>HYGROMETER,</b> Mean moist & drought	1 m	30 d.	20 d.	
Clear -	16 days.			
Cloudy -	13 do.			
Rain -	10 times.			
Quantity of do.	6 inches.			

**THUNDER** fourteen times. **Mean heat of the sun** 110° to 111°.

**THE** air this month has been drier than that of the preceding, but the winds being more from the SE quarter, is the reason of the mercury being so low; much close and sultry weather about the middle. The variation on the Barometer much greater than usual.

Cagaita, May, 1785.

Day.	Thermom.			Moon's mean density each quarter.	Barometer			Hygrometer.						Rain.	Wind and Force					
	M.	N.	E.		M.	N.	E.	M		N.		E.			Point	M.	N	E		
								d	m	d	m	d	m.							
1	82	92	86	L. Q. 688	29.82	29.80	29.81	40	10				10	0.5	S	1	2	1	Clear	
2	83	91	85		.77	.74	.75	30	10				10				2	2	2	ditto
3	83	91	87		.75	.68	.75	30	20			20					1	1	2	ditto
4	87	91	86		.76	.78	.83	15	40			20					6	3	1	ditto
5	85	89	86	N. M. 690	.78	.83	.87	0	30			20				1	4	4	Cloudy	
6	83	90	83		.96	.86	30.03	15	30			20				2	3	2	Clear	
7	81	87	84		.78	.78	29.94	10	15			30			E	1	2	1	Cloudy	
8	82	90	87		.95	.92	.97	10	50			30			S	0	2	0	Clear	
9	83	90	85	F. Q. 688	.94	.89	.95	10	50			25		0.3		0	2	1	ditto	
10	83	89	85		.92	.85	.80	10	45			20			SE	0	2	0	ditto	
11	84	90	83		.86	.79	.83	10	50			30				0	2	2	ditto	
12	83	90	83		.80	.77	.85	10	50			15				0.1	1	2	2	ditto
13	84	89	85	F. M. 685	.80	.78	.83	10	45			35		1.4		3	3	0	ditto	
14	84	91	85		.83	.77	.82	25	50			30					0	1	0	Cloudy
15	84	92	86		.84	.77	.80	10	60			55					0	1	0	Clear
16	86	93	84		.81	.76	.86	40	60			55				SW	0	0	0	ditto
17	82	92	85	F. M. 688	.83	.81	.90	20	56			30		1.4		0	1	0	Cloudy	
18	80	88	84		.77	.86	.93	10	40			20			S	0	1	0	ditto	
19	81	88	86		.89	.81	.83	10	50			40			SW	1	0	0	Clear	
20	83	89	86		.80	.72	.79	10	50			40			S	0	0	0	Cloudy	
21	84	91	83	F. M. 685	.75	.67	.79	10	55			40		0.2		0	1	1	Clear	
22	82	90	87		.74	.65	.75	30	40			40					0	1	0	Cloudy
23	83	91	89		.69	.58	.66	10	40			35			SE	0	1	0	Clear	
24	87	94	89		.63	.53	.66	20	20			20			S	0	0	4	Cloudy	
25	84	92	82	F. M. 685	.60	.59	.63	10	60			10		1.3		1	0	0	ditto	
26	79	88	85		.65	.64	.70	10	50			20			SE	1	0	0	ditto	
27	84	90	80		.65	.64	.76	20	40				10	0.5		0	3	1	ditto	
28	82	88	85		.70	.70	.78	20	40							0	1	3	Clear	
29	81	88	82	F. M. 685	.73	.70	.75	10	40			10		0.4	S	3	3	1	Cloudy	
30	84	90	85		.74	.66	.72	20	0					0.1		3	3	2	Clear	
31	83	87	85		.61	.68	.72	40	20			40		1.2	SW	2	1	1	Cloudy	
mean	83	89	85		29.77	29.74	29.82	8	9	40	1	23	3	6.0		4	2	1	Clear	

Clear

*A General State of the Weather for June, 1785.*

	N.	M.	E.	
<b>THERMOMETER,</b> Greatest altitude	84	90	85	} 82½
Least do. -	79	80	79	
Mean do. -	81½	84½	82	
<b>BAROMETER,</b> Greatest do. in.	29.70	29.68	29.72	} 29.58
Least do. -	29.44	29.40	29.47	
Mean do. -	29.59	29.56	29.61	
Greatest variation	.26	.28	.25	
Mean density	.687	.681	.685	} .684
<b>HYGROMETER,</b> Mean moisture	50 m.	30 m.	40 m.	

Clear - 4 days.  
 Cloudy - 26 do.  
 Rain - 24 times.  
 Thunder - 16 do.  
 Quantity of rain 24-4 inches.

MEAN heat of the sun 106°.

THE quantity of rain this month has been uncommonly great, and scarce a day has passed without some falling; the weather of course disagreeable and unhealthy.

THE mercury in the barometer very low, which seldom fails to be the case while the winds come from the SE and E quarters.

Calcutta, June, 1785.

Day.	Thermom.			Moon's mean density each quarter.	Barometer			Hygrometer.						Rain	Wind at 6 Force				
	M	N.	E		M.	N.	E.	M.		N.		E.			Point	M	N.	E	
								d.	m	d.	m	d.	m.						
1	84	92	83	N. M. .687	29.61	29.54	29.65	40		10		20	0.2	S				Cloudy	
2	83	85	82		.63	.61	.63	40		20		40		SE	1	1		ditto	
3	81	90	83		.68	.67	.70	45		0		20			1	1	1	Clear	
4	81	85	82		.70	.66	.72	40		40		50	0.7		1			Cloudy	
5	81	86	83		.70	.62	.64	40		30		40		NE	1	1	1	ditto	
6	81	85	83		.62	.55	.61	60		30		40	0.1	E	1	1	1	ditto	
7	82	85	82		.59	.61	.69	50		50		50	0.1		1	1		ditto	
8	82	84	80		.64	.60	.68	60		60		60	0.5	SE	1			ditto	
9	80	80	82		.68	.65	.70	60		60		60	2.7			1	1	ditto	
10	80	84	84		.57	.64	.68	60		40		60	1.5	S		1		Clear	
11	82	84	84	F. Q. .681	.67	.64	.70	60		20		50	0.1			1		Cloudy	
12	82	87	84		.70	.68	.70	50		10		30				1		Clear	
13	84	87	85		.62	.63	.58	30		30		30				1		ditto	
14	83	87	81		.56	.46	.50	50		30		30	0.2			1		Cloudy	
15	84	84	82		.44	.40	.47	50		50		40	2.9	SE			2	ditto	
16	81	84	80		.48	.49	.57	60		50		50	1.7			1		ditto	
17	82	83	80		.54	.58	.65	60		60		50	1.4	E		1		ditto	
18	79	82	79		.63	.62	.67	60		60		60	2.9	SE		1	1	ditto	
19	80	82	80		.58	.50	.60	60		40		60	1.3			1	2	1	ditto
20	80	82	81		.57	.54	.62	60		40		50	0.2			2	1	1	ditto
21	79	83	82	F. M. .687	.57	.54	.60	50		40		40	0.3			1		ditto	
22	81	84	82		.57	.55	.57	40		50		50	N			1	1	ditto	
23	81	82	80		.55	.55	.55	50		30		60	5.9					ditto	
24	80	84	82		.56	.52	.58	50		30		40	0.1			1	1	ditto	
25	82	85	83	L. Q. .681	.53	.52	.57	50		30		40	N			1	1	2	ditto
26	82	85	83		.52	.52	.55	50		30		40	0.1			1		ditto	
27	83	85	84		.47	.48	.54	50		30		40	0.1				1	ditto	
28	82	84	83		.35	.45	.50	50		30		40	0.6			1		ditto	
29	82	85	84		.48	.44	.48	50		30		40					2		ditto
30	82	85	84		.46	.45	.49	50		30		40	0.8	NE			2	1	ditto
mean	81½	84½	82		29.59	29.56	29.61	50		30		40	24.4			½	½	½	Cloudy



Calcutta, July, 1783.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain.	Wind and Force				
	M	N.	E.		M	N.	E.	M		N.		F.			Point	M	N.	E.	
								d.	m.	d.	m.	d.	m.						
1	82	86	83	N. M. .684	29.47	29.46	29.52	40	20	40	0.1	SE	0	0	0	Cloudy			
2	80	80	85		.51	.50	.58	40	30	40	0.3	NE	1	1	2	ditto			
3	79	83	81		.52	.53	.57	50	30	50	0.2		1	0	3	ditto			
4	80	84	81		.56	.54	.60	60	40	0	2.6	S	0	1	0	ditto			
5	82	82	81		.58	.54	.59	60	50	60	0.3	S	0	0	0	ditto			
6	81	80	80		.54	.45	.47	60	60	60	2.6	SE	0	0	3	ditto			
7	79	83	81		.44	.47	.57	60	60	60	0.1	SW	0	2	2	ditto			
8	80	82	80		.54	.57	.63	60	60	60	0.4	SE	1	1	1	ditto			
9	80	84	81		.60	.59	.66	60	60	60		S	0	1	1	ditto			
10	80	85	83		.66	.63	.70	60	20	40		R	0	1	1	ditto			
11	82	84	82	F. Q. .686	.68	.66	.70	60	30	40	1.3	SE	0	0	1	ditto			
12	81	85	83		.66	.57	.58	50	30	40	1.7	SE	0	1	2	ditto			
13	83	83	82		.55	.48	.54	50	40	50	0.1	SE	1	1	3	ditto			
14	81	83	81		.52	.51	.62	50	40	50	0.1	SE	1	1	3	ditto			
15	80	84	83		.63	.63	.68	50	20	30		SW	2	2	2	ditto			
16	82	85	83		.67	.60	.64	50	30	40	0.3	S	2	1	2	ditto			
17	82	86	84		.62	.57	.57	50	20	30	0.2	S	1	1	4	Clear			
18	82	83	81		.52	.49	.50	50	30	40	0.5	SW	1	2	3	Cloudy			
19	80	84	80		.47	.50	.57	50	20	10	0.6	SE	1	1	0	ditto			
20	80	83	82		.55	.54	.60	50	30	40	0.6	SW	0	0	1	ditto			
21	81	84	82	F. M. .687	.57	.55	.63	50	30	40		S	0	1	1	ditto			
22	81	83	81		.60	.62	.66	50	40	40	0.1	SE	0	0	0	ditto			
23	80	84	81		.66	.64	.72	50	40	30	0.1	R	1	1	0	ditto			
24	80	85	83		.72	.67	.73	50	40	20		S	1	2	0	ditto			
25	83	87	85		.73	.67	.69	25	10	10		S	1	1	0	Clear			
26	84	87	84		.72	.67	.72	30	30	10	0.1	SE	0	0	1	ditto			
27	84	86	84		.70	.63	.67	10	10	10		S	0	0	0	Cloudy			
28	84	85	84		.67	.60	.64	30	0	0	0.3	SE	0	2	1	ditto			
29	84	89	87		.64	.58	.66	40	0	20			0	1	0	Clear			
30	84	87	85		.60	.56	.60	40	20	20	0.1		0	1	0	Cloudy			
31	82	86	84		.57	.46	.65	40	10	20	0.1		1	0	1	ditto			
mean	81½	84½	82½		29.59	29.56	29.62	50	35	45	12.8		½	1	1	Cloudy			

*A General State of the Weather for August, 1785.*

	M.	N.	E.	
<b>THERMOMETER,</b> Greatest altitude	84	89	86	
Least do. -	79	80	80	} 82½
Mean do. -	81½	84½	82½	
<b>BAROMETER,</b> Greatest do. in.	29.78	29.72	29.78	} 29.62
Least do. -	29.50	29.49	29.57	
Mean do. -	29.62	29.59	29.64	
Greatest variation	.28	.23	.21	
Mean density	.687	.682	.686	} .685
<b>HYGROMETER,</b> Mean moisture	50 m.	30 m.	40 m.	
Clear -	-	3 days.		
Cloudy -	-	28 do.		
Thunder -	-	16 times.		
Rain -	-	20 do.,		
Quantity of do.		9.3 inches.		

THE heat of the sun at mid-day 100°.

MUCH cloudy weather, but seldom any very heavy falls of rain, and the quantity altogether but moderate. The river very full; and accounts of heavy rains up the country.

THE barometer remarkably low the whole month: a proof of there being still much water in the clouds.

Calcutta, Aug<sup>st</sup>, 1785.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain.	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N	E	
								d	m.	d.	m.	d.	m.						
1	80	84	82	N. M. .685	22.53	29.50	29.58	50		40		40		0.3	SE	0	1	1	Cloudy
2	81	86	83		.56	.53	.60	50		30		20				0	1	0	Clear
3	83	84	83		.59	.56	.63	50		20		30				0	1	0	Cloudy
4	83	87	85		.60	.55	.60	40		20		20		0.1		1	1	0	ditto
5	81	83	81		.59	.58	.61	40		40		40		1.3		1	1	0	ditto
6	80	83	81		.56	.54	.60	50		40		50		0.9		1	1	1	ditto
7	81	84	81		.58	.56	.65	60		40		50		0.2		0	1	0	ditto
8	80	82	81		.63	.62	.74	60		50		50		1.2		0	1	1	ditto
9	80	80	80	F. Q. .686	.74	.74	.76	60		60		50		0.1		0	0	1	ditto
10	79	84	82		.74	.68	.70	60		50		50				0	1	1	ditto
11	82	87	85		.65	.59	.62	60		30		50				0	0	1	Clear
12	82	85	83		.60	.61	.64	50		30		40				0	1	1	Cloudy
13	81	83	82		.63	.60	.64	50		40		30				0	0	0	ditto
14	81	85	84		.58	.50	.57	50		30		40		0.3		0	1	1	ditto
15	83	86	84		.53	.49	.57	50		40		30		0.4		0	1	0	ditto
16	82	83	82		.54	.53	.57	50		30		20		0.5	NE	1	1	2	ditto
17	82	84	82	F. M. .687	.50	.54	.62	50		20		30		0.2	SE	1	1	1	ditto
18	83	84	83		.62	.58	.64	50		30		40		1.3		1	1	1	ditto
19	84	87	85		.60	.58	.65	50		20		30				0	1	2	ditto
20	80	80	86		.58	.60	.65	40		0		0			NE	0	1	1	Clear
21	84	85	85		.62	.60	.67	20		20		20			SE	0	1	0	Cloudy
22	83	87	84		.62	.57	.64	30		10		20		0.2		4	1	1	ditto
23	83	85	83		.61	.60	.66	40		30		30		0.1		1	1	1	ditto
24	81	85	82		.63	.63	.70	40		30		30		0.3	NE	1	1	1	ditto
25	82	85	84	L. Q. .690	.68	.67	.72	40		30		40				1	1	0	ditto
26	81	84	81		.70	.66	.71	40		30		40		0.3		0	0	2	ditto
27	80	84	81		.73	.70	.78	40		30		30		0.1		0	0	1	ditto
28	81	85	83		.78	.72	.78	40		20		30		0.1		0	0	1	ditto
29	81	85	83		.74	.67	.76	50		20		30			SE	0	0	1	ditto
30	82	84	83		.70	.67	.73	40		20		30		0.1		0	0	0	ditto
31	82	83	82		.67	.62	.69	30		30		20		1.4		1	1	1	ditto
mean	81½	84½	82½		29.62	29.59	29.64	50		30		40		9.3	SE	½	1	1	Cloudy



*A General State of the Weather for September, 1785.*

	N.	M.	E.	
THERMOMETER, Greatest altitude	84 <sup>o</sup>	89 <sup>o</sup>	85	} 82½
Least do. -	80	81	80	
Mean do. -	81	85	82½	
BAROMETER, Greatest do. in.	29.83	29.82	29.87	} 29.71
Least do. -	29.62	29.59	29.60	
Mean do. -	29.71	29.68	29.75	
Greatest variation	.21	.23	.21	
HYGROMETER, Moisture -	45 m.	20 m.	25 m.	} .686
Density -	.687	.682	.688	
Clear -	8 days.			
Cloudy -	22 do.			
Thunder -	13 times.			
Rain -	16 do.			
Quantity of do.	11.7 inches.			

MEAN heat of the sun at mid-day 110°.

THE barometer higher than the former month : about the middle and end, great quantities of rain. By account from *Berhampore*, the quantity of rain there must have been considerable, and many parts above, the whole country being under water, and the river swelling prodigiously. This month very unhealthy, and many people dying.

## APPENDIX.

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Calcutta, September, 1785.

Day	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain	Wind and Force.				
	M.	N.	E.		M.	N.	E.	M.		N.		E.			Point.	M.	N.	E.	
								d	m	d	m	d	m						
1	80	84	82	N. M. .692	29.65	29.64	29.74	40		20		20		0.2	NE	2	2	2	Cloudy
2	80	83	81		.70	.69	.77	30		20		30				1	1	1	ditto
3	80	85	81		.75	.74	.82	50		20		20				1	1	1	Clear
4	81	87	85		.77	.73	.80	40		10		20			SE	0	1	0	ditto
5	82	88	85		.78	.76	.84	30	10		10					0	1	0	ditto
6	83	89	85		.80	.74	.80	30	20		0	0				0	1	0	ditto
7	84	88	85		.76	.73	.77	20	20		10					1	0	0	ditto
8	82	89	85	F. Q. .688	.77	.73	.80	30	10		10			0.5	E	1	1	1	ditto
9	84	87	85		.80	.76	.85	20	10		0	0				0	1	0	Cloudy
10	83	85	83		.83	.82	.87	20		10		0	0			0	1	0	ditto
11	83	84	82		.82	.77	.80	40		20		30			E	0	1	0	ditto
12	82	86	83		.97	.68	.73	40		20		20				1	0	1	ditto
13	82	88	83		.68	.63	.70	40		20		20				0	0	1	ditto
14	82	84	82		.66	.62	.69	40		20		20			NE	0	1	0	Clear
15	81	87	83	F. M. .688	.64	.60	.68	40		30		20		0.4	E	0	1	0	Cloudy
16	81	85	83		.66	.64	.72	40		30		20			SE	2	1	0	Clear
17	81	84	81		.67	.66	.73	50		40		20			NE	2	1	1	Cloudy
18	80	83	82		.68	.64	.70	50		30		40				2	1	2	ditto
19	81	84	81		.62	.59	.60	50		40		50			SE	2	1	1	ditto
20	80	84	80		.62	.60	.70	50		40		50				1	0	1	ditto
21	80	82	81		.68	.72	.78	50		40		50				1	2	2	ditto
22	80	82	81	I. Q. .686	.78	.77	.80	50		30		0	0.1	1.3	E	3	2	2	ditto
23	81	87	85		.78	.72	.74	40		10		20				1	1	0	ditto
24	84	87	85		.72	.66	.70	20		10		10				0	0	0	Clear
25	83	86	82		.66	.62	.70	20		0		10			SE	0	0	0	Cloudy
26	81	83	80		.66	.64	.72	20		20		10				1	2	2	ditto
27	80	83	81		.66	.63	.68	30		20		20				1	1	2	ditto
28	80	81	80		.62	.60	.67	5		50		30	0.6			1	2	2	ditto
29	80	84	81	I. Q. .686	.66	.66	.72	5		10		50	3.5			2	2	3	ditto
30	80	85	83		.70	.73	.78	5		20		20	0.2			0	1	1	ditto
mean	81	85	82½		29.71	29.68	29.75	45	2	20	1	52	11.7		SE	1	1	1	

*A General State of the Weather for October, 1785.*

	M.	N.	E.	
THERMOMETER, Greatest altitude	84	88	85	} 83
Least do. -	77	82	79	
Mean do. -	81	85½	82½	
BAROMETER, Greatest do. in.	29.98	29.96	29.98	} 29.91
Least do. -	22.83	29.81	29.85	
Mean do. -	29.90	29.87	29.96	
Greatest variation	.15	.15	.13	} .691
HYGROMETER, 5 d.	5 d.	24 d.	7 d.	
Mean density	.694	.684	.692	

Clear    - 21 days.  
 Cloudy   - 10 do.  
 Thunder - 4 times.  
 Rain     - 7 do.  
 Quantity 1-4 inches.

THE mean heat of the sun at mid-day 110°.

THE wind began to set in from the NW about the 12th and 13th.

# APPENDIX.

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Calcutta, October, 1785.

Day.	Thermom.			Moon's mean density each quarter.	Barometer.			Hygrometer.						Rain.	Wind and Force						
	M	N.	E.		M.	N.	E.	M		N.		E.			Point.	M.	N	E			
								d.	m	d	m	d	m								
1	83	85	84	N. M. .691	29.84	29.80	29.85	30	20			10		0.1 0.6 0.1	NE	0	0	0	Clear		
2	81	85	83		.83	.82	.85		10	40		30					0	0	0	ditto	
3	83	87	85		.83	.81	.86	10		30		10					0	0	0	ditto	
4	82	87	84		.85	.85	.90	10		40		10					0	0	1	ditto	
5	82	87	84		.88	.86	.93		0	30		0					0	0	0	ditto	
6	84	88	85		.95	.88	.92	10	10	0		0					0	0	0	ditto	
7	83	87	85		.90	.82	.90		0	10		0					0	0	1	ditto	
8	82	85	81		.88	.82	.90		0	10		0					1	1	1	Cloudy	
9	81	82	80	F. Q. .695	.88	.85	.91	10	0			10		0.1 0.6 0.1	NW	1	2	2	ditto		
10	78	84	81		.91	.88	.96	10	30			10					1	1	1	ditto	
11	81	85	83		.96	.90	.94	10	20			10					0	1	0	Clear	
12	83	87	82		.94	.90	.96		0	30		10					0	1	1	ditto	
13	82	87	85		.95	.90	.96		0	40		10					0	1	0	ditto	
14	83	88	85		.95	.89	.93	10	40			10					0	1	1	ditto	
15	84	88	84		.95	.91	.98		0	40		20					0	1	0	ditto	
16	83	85	85		.98	.93	.96		0	10		0					0	1	1	ditto	
17	83	87	84	F. M. .693	.97	.92	.93	10	40			10		0.2 R	SW NE	1	1	0	ditto		
18	81	88	85		.93	.89	.97		0	30		10					1	1	0	ditto	
19	82	88	83		.92	.96	.94		0	30		10					0	1	1	ditto	
20	81	85	83		.90	.84	.96	10	50			30					1	1	1	ditto	
21	81	86	83		.90	.85	.91	20	50			30					0	1	0	ditto	
22	79	87	82		.92	.84	.89	10	50			20					0	1	1	ditto	
23	79	86	82		.91	.87	.93	10	50			30					0	1	0	ditto	
24	80	85	83		.92	.90	.95	20	40			20					1	0	0	ditto	
25	79	86	84	L. Q. .698	.94	.90	.94		0	30		20		0.2 R	SW NE	0	1	0	ditto		
26	79	83	79		.90	.88	.90		0	20		10					0	2	2	Cloudy	
27	79	82	80		.86	.82	.88	30		10		20					0	2	1	ditto	
28	78	82	79		.87	.84	.88	30		0		10					0	2	1	ditto	
29	77	82	79		.85	.82	.92	30		10		10					0	2	2	ditto	
30	78	82	79		.90	.86	.92	30		10		10					NW	0	1	0	ditto
31	87	82	80		.92	.90	.95	30				10	0.1				NE	0	0	0	ditto
Mean	81	85½	82½		29.90	29.87	29.96	3	6	25	1	10	3	1.4	NW	1	1	1	Clear		

*A General State of the Weather for November, 1785.*

		M.	N.	E.	
THERMOMETER,	Greatest altitude,	80	85	82	75
	Least do. -	67	74	71	
	Mean do. -	73	78½	75	
BAROMETER,	Greatest do. in.	30.10	30.08	30.12	29.98
	Least do. -	29.90	29.82	29.80	
	Mean do. -	29.99	29.98	30.80	
	Greatest variation,	.20	.26	.32	
HYGROMETER,		15 d.	25 d.	20 d.	.705
	Mean density,	.709	.700	.706	

Clear - 26 days.  
 Cloudy - 4 do.  
 Rain - 4 times.  
 Quantity do. 0.5 inches.

MEAN heat of the sun at mid-day 100°.



*A General State of the Weather for December, 1785.*

		M.	N.	E.	
THERMOMETER,	Greatest altitude	70	76	73	} 69
	Least do. -	63	71	66	
	Mean do. -	65½	73½	69	
BAROMETER,	Greatest do. in.	30.09	30.06	30.10	} 30.01
	Least do. -	29.97	29.90	29.99	
	Mean do. -	30.02	29.98	30.03	
	Greatest variation	.12	.16	.11	
HYGROMETER,		30d	50d	40d	} .716
	Mean density	.721	.709	.719	

Clear - 31 days.

THE weather throughout the month remarkably clear and pleasant, and much milder than it is usually at this season of the year.

MEAN heat of the sun at mid-day, about 96°.

## Calcutta, December, 1785.

Day.	Thermom			Moon's mean density each quarter.	Barometer			Hygrometer.						Rain.	Wind and Force.			
	M	N	E.		M.	N.	E.	M.		N.		E.			Point.	M	N	E.
								d	m	d	m	d	m.					
1	68	76	78	N. M. 714	30.00	29.97	29.99	30		50		40		N	W	W	W	Clear
2	70	75	72		29.99	.95	30.00	30		50		40						ditto
3	70	75	72		30.03	.98	.02	30		50		40						ditto
4	69	75	72		.04	.98	.03	30		50		40						ditto
5	68	75	71		.01	.96	.00	30		50		40						ditto
6	67	75	71	F. Q. 720	29.98	.95	29.99	25		45		45						ditto
7	67	74	71		.99	.96	.99	25		45		35						ditto
8	67	74	69		.99	.99	30.04	30		45		35						ditto
9	67	74	69		30.06	.99	.05	30		40		35						ditto
10	67	74	69		.05	.97	.04	35		45		40						ditto
11	67	75	70	F. M. 728	.05	.94	.10	30		50		40						ditto
12	68	75	70		.08	.99	.08	30		55		40						ditto
13	66	75	70		.09	30.05	.08	30		55		40						ditto
14	64	74	68		.06	.04	.09	30		55		45						ditto
15	63	71	66		.07	.03	.09	30		60		45						ditto
16	63	71	67	I. Q. 722	.08	.02	.05	30		55		40						ditto
17	63	72	67		.04	.02	.04	25		45		40						ditto
18	66	73	67		.03	.00	.02	25		35		40						ditto
19	64	73	68		.00	.00	.01	25		40		30						ditto
20	63	73	69		29.97	29.97	.05	30		40		40						ditto
21	65	73	69	N. M. 728	30.02	.98	.02	30		50		45						ditto
22	65	74	69		.00	.98	.03	30		40		30						ditto
23	66	73	69		.05	.97	.03	35		40		30						ditto
24	67	74	68		.03	.91	.06	35		45		25						ditto
25	65	73	67		.04	.90	.02	40		45		40						ditto
26	64	73	67	F. Q. 720	.06	.96	.00	30		50		40						ditto
27	63	72	68		29.96	.95	.02	30		55		45						ditto
28	64	73	68		.08	.97	.01	30		55		50						ditto
29	64	73	67		.09	.95	.04	30		55		45						ditto
30	64	73	68		30.00	30.00	.07	30		50		40						ditto
31	63	72	67	728	.07	.09	.09	30		40		40						ditto



FROM the foregoing DIARY of the Weather, it may be remarked in regard to the variation of the Barometer, that during the cold season, from November to March, the mercury is at its greatest height, and at the lowest during the rainy months, May, June, July, August, and September. The variation of the Thermometer, or the difference between the temperature of mid-day and that of the morning and evening is very trifling, seldom exceeding 3 or 4° during the rains, whereas, during the cold season, the difference is 8 or 10°



# KEPT AT CALCUTTA, 1784.

Evening.				Mean state of the atmosphere.			Moisture.			Appearance of the atmosphere.		Thunder No times.	Winds.	
Lowest.	Highest.	Mean.	Variation.	Temperature.	Weight.	Density.	Moisture.	Rainy days.	Quant. rain.	Number of clear days.	Cloudy do.		Point.	Force.
				74.4		700	6	8	4.2	3	26	6	S	12
				70.4		692	5	3	18	16	15	3	S	3
				86.4		681	10	6	3.1	14	16	6	S	4
				81.4		683	15	12	9.6	7	24	13	S	22
				83		686	25	14	17.4	1	29	5	SE	1
				83		686	25	20	15.	1	30	5	S&SE	1
29.61	29.76	29.70	.15	82.3	29.67	686	25	23	16.9	5	26	13	S&SE	1
75.1	.97	.89	.22	82.4	.81	690	24	12	11.5	1	20	5	S&SE	1
76.	30.02	.92	.26	82.4	.91	692	2	3	.8	19	12	1	NW	1
.92	.08	30.02	.16	76	30.00	702		1	.9	23	7		NW	1
30.02	.17	.09	.15	68.2	.08	718		1	.05	26	5		NW	1
.03	.17	.09	.14	66	.08	722				29	2		SW	2
27.85	30.03	29.94	.18	79	29.92	695		105	81.0	11	212	59		2

# KEPT AT CALCUTTA, 1785.

Evening.				Mean state of the atmosphere.			Moisture.			Appearance of the atmosphere.		Thunder No times.	Winds.	
Lowest.	Highest.	Mean.	Variation.	Temperature.	Weight.	Density.	Moisture.	Number of rainy days.	Quant. rain.	Number of clear days.	Cloudy do.		Point.	Force.
30.03	30.17	30.09	.14	66	30.08	722				29	2		SW	2
27.90	.15	.04	.19	75	.02	706		4	2.9	17	11	4	SW	1
.86	.13	29.97	.27	79	29.95	698		3	0.5	20	11	5	S	3
1	.74	29.97	.86	.23	82.4	.83	690	6	8.0	17	13	6	S	3
1	.63	30.03	.82	.30	86	.77	682	10	6.0	18	13	14	S	2
3	.17	29.72	.61	.26	83	.58	684	24	24.4	4	26	16	SE	1
2	.47	.73	.62	.26	83	.59	684	24	12.8	4	27	11	SE	1
3	.57	.78	.64	.26	83	.62	685	20	9.3	3	28	16	SE	1
3	.66	.87	.75	.21	83	.71	680	10	11.7	8	22	13	S	1
3	.85	.98	.06	.13	83	.91	691	7	1	21	10	4	NW	1
3	.80	30.12	.32	.75	.98	705		4	0.5	26	4	0		2
6	.90	.10	.03	.11	69	30.01	716			31				1
4	29.75	29.96	29.87	.22	77	29.84	696		118	77.5	198	167	89	2

## II.

### A S Y N O P S I S

OF THE

DIFFERENT CASES THAT MAY HAPPEN IN DEDUCING THE LONGITUDE OF ONE PLACE FROM ANOTHER, BY MEANS OF ARNOLD'S CHRONOMETERS, AND OF FINDING THE RATES WHEN THE DIFFERENCE OF LONGITUDE IS GIVEN.

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BY MR. REUBEN BURROW.

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**I**T was formerly the custom to give rules for calculation, without any investigation of their principles; but the contrary method has so much taken place of late, that those who are not acquainted with the theory of a subject, are seldom in a capacity of calculating at all; and those who are acquainted with it, must either lose time by recurring thereto continually, or run the hazard of often making mistakes. Indeed the use of practical rules is so obvious, that NEWTON has often given them when he has omitted their demonstrations; and the want of them has been noted by BACON among the deficiencies of learning. The Hindoos were so particularly attentive in that respect, that they usually gave two rules for the same operation; one couched in the shortest terms possible, and often in verse, for the ease of the memory; and the other more at length, as an explanation. It therefore is much to be wished that authors would revert to the ancient custom so far, as to pay some attention to the reduction of their knowledge to practice, that people may not be under the necessity of investigating rules at the time that they want to use them.

THE

THE following is one rule, out of a great number, that I drew up for my own use in determining the situations of places in *India*; and I insert it here on account of its utility and easiness of application.

Let  $E$  = Error of the Watch from mean time at the first place ;

$e$  = Error from mean time at the second place ;

$T$  = Time by the Watch at the second place, when the error was  $e$  ;

$D$  = Difference of Longitude between the places ;

$N$  = Interval of mean time between the observations at the two places  
(found by taking the interval by the Watch, and correcting it according to the estimated rate, &c.)

$r$  = Rate of the Watch, or what it gains or loses in a day of mean time.  
Then,

Fast for mean time at both places, and the watch be	Gaining	then	T—E—nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T—e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	Is the difference of Longitude.
Slow for mean time at both places, and the watch be	Gaining	then	T—E—nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T—e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	E—e+nr e—E—nr E—e—nr e—E+nr e—E—nr E—e—nr E—e—nr nr—e—E E+e—nr
	Losing	then	T—E+nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T—e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	E—e+nr e—E—nr E—e—nr e—E+nr e—E—nr E—e—nr E—e—nr nr—e—E E+e—nr
	Gaining	then	T+E—nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T+e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	E—e+nr e—E—nr E—e—nr e—E+nr e—E—nr E—e—nr E—e—nr nr—e—E E+e—nr
	Losing	then	T+E+nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T+e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	E—e+nr e—E—nr E—e—nr e—E+nr e—E—nr E—e—nr E—e—nr nr—e—E E+e—nr
Fast for mean time at first place, and slow for mean time at second place, and the watch be	Gaining	then	T—E—nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T—e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	E+e+nr E+e+nr E+e+nr E+e—nr nr—E—e
	Losing	then	T+E÷nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T—e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	E+e+nr E+e+nr E+e+nr E+e—nr nr—E—e
	Gaining	then	T—E—nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T+e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	E+e+nr E+e+nr E+e+nr E+e—nr nr—E—e
	Losing	then	T—E+nr	Is the mean time at the first place when the watch was T at the second place, and when the mean time at the second place was	T+e	E W	(D—E+e):n (e—E—D):n (E—D—e):n (D+E—e):n (D+E—e):n (E—D—e):n (e—E—D):n (D+E+e):n (D+E—e):n (E—D+e):n Impossible.	Is the time of the watch, and	E+e+nr E+e+nr E+e+nr E+e—nr nr—E—e



## III.

MEMORANDUMS CONCERNING AN OLD BUILDING.  
IN THE HADJIPORE DISTRICT,  
NEAR THE GUNDUCK RIVER, &c.

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BY MR. REUBEN BURROW.

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THE pyramids of *Egypt*, as well as those lately discovered in *Ireland* (and probably too the *Tower of BABEL*) seem to have been intended for nothing more than images of MAHADEO.

Two of the *Sakkara* pyramids, described by NORDEN, are like many of the small ones, usually built of mud, in the villages of *Bengal*: one of the pyramids of *Dashour*, drawn by POCOCK, is nearly similar to that I am going to mention, except in the acuteness of the angle: most of the *Pagodas* of the *Carnatic* are either complete or truncated pyramids; and an old Stone Building, without any cavity, which I saw in *Yambeah*, near the *Catabedu River*, on the *Aracan Coast*, differed so little from a pyramid, that I did not suspect it was meant for the image of SEEVA, till I was told it by the natives.

THE largest building of the kind which I have yet seen in *India*, is about two days journey up the *Gunduck River*, near a place called *Keffiveah*: it goes by the name of “BHEFM SAIN’S DEWRY,” but seems evidently intended for the well known image of MAHADEO, having originally been



a cylinder placed upon the frustum of a cone, for the purpose of being seen at a distance. It is at present very much decayed ; and it is not easy to tell whether the upper part of the cylinder has been globular or conical ; a considerable quantity of the outside is fallen down, but it still may be seen a good distance up and down the river.

THE day I went from the river to view it was so uncommonly hot, that the walk and a fever together obliged me to trust to the measurements of a servant. For want of a better instrument, he took the circumference of the cylindrical part in lengths of a spear, and from that as a scale, and a sketch of the building taken at a distance, I deduced the following dimensions. What dependence there may be on his measures I cannot determine ; but probably they are not very erroneous.

Diameter of the Cylindrical part,	-	-	-	-	64 feet
Height of the Cylinder,	-	-	-	-	65
Height of the Conic Frustum on which the Cylinder is placed,					93
Diameter of the Cone at the base,	-	-	-	-	363

BOTH the Cone and the Cylinder were of bricks ; those of the last were of different sizes, many of them two spans long and one broad ; others were of the common size, but thinner, and they were well burnt, though bedded in mortar little better than mud. There did not appear any signs of the Cylinder's being hollow : the conical part was overgrown with jungle, but I broke through it in several places, and found it everywhere brick.

I do not recollect whether it be visible from the site of the ancient city where the famous Pillar of *Singeah* stands, or not ; but have a faint idea that

that it is. What the intention of these extraordinary columns may have been originally, is perhaps not so easy to tell: at first sight it would seem that they were for holding inscriptions, because those of *Bettiah*, *Delhi*, and *Illahabad*, have inscriptions (though in a character that has not been yet decyphered); but the pillar of *Singeah* seems to have none whatever, for some *Bramins* told me they attended at the time it was dug to the foundation, near twenty feet under ground, by a gentleman of *Putna*, who had hopes to have found some treasures; and that there was not the least vestige of any inscription upon it. Probably those pillars, *CLEOPATRA's Needle*, and the *Devil's Bolts* at *Borcughbridge*, may all have the same religious origin.

PERHAPS the connexion of time and place may apologize for the diversity of the subject, in mentioning that, while I sat under the shade of a large tree near the pyramid, on account of the sultry heat, some of the people of the adjacent village came and played there with *Coxeries* on a diagram that was formed, by placing five points in a circular order, and joining every pair of alternate points by a line, which formed a kind of pentagon. This brought to my recollection a circumstance told me by a gentleman in *England*; that an old piece of silver plate had been dug out of the earth with such a figure upon it; the use of it was totally unknown, as well as the age; and I was desirous to find what geometrical properties the figure possessed: one I remember was, that if any number of points whatever were placed in a circular order, and each two alternate points joined, then the sum of all the salient angles of the figure would be equal to two right angles when the number of points was odd; but equal to four right angles when the number was even. *EUCLID's* properties of the angles of the triangle and trapezium, are particular cases of these; but I had no suspicion

of the real intention of the figure till I saw the use here made of it. It seems however an argument in favour of the identity of the *Druids* and *Brahmins*, as well as another well known diagram, usually called *the Walls of Troy*, which was used originally in the *Hindoo* astrology. These figures however appear to have flowed from a much higher source, and to have relation to what LEIBNITZ had a distant idea of, in his Analysis of Situation, EUCLID in his Porisms, and GIRARD perhaps in his Restitution of them. In fact, as the modern Algebraists have the advantage of transferring a great part of their labour from the head to the hands, so there is reason to believe that the *Hindoos* had *mechanical methods of reasoning geometrically*, much more extensive than the elementary methods made use of at present; and that even their games were deduced from and intended perhaps to be examples of them; but this deserves to be treated more at length elsewhere.

THE same apology may perhaps excuse my mentioning here, that the idea of the *Nile's* deriving its floods from the melted snows, as well as the *Ganges*, appears to be rather imaginary: they seem to be caused principally by the rains; for the high hills beyond the *Herdwar* apparently retain their snow all the year, and therefore the quantity melted could never produce the enormous swell of the *Ganges*, not to mention that the effect of a thaw seems different from what would arise from the mere difference of heat, and therefore might partly take place in winter and the dry season. That the rains are sufficient for the purpose, without recurring to the hypothesis of melted snows, appears from the following fact:—A little before I observed the aforesaid pyramid, I had been a considerable distance up the *Gunduck*; the river was low for the time of the year, and the hills that skirt the borders of *Nepaul* were clear, and apparently not above fifteen  
 fcofs

cofs distant ; soon after, a heavy shower fell upon them for some hours, and the river soon after was filled to the very banks, and continued so for many days ; and large trees were torn up by the roots, and came driving down with such force by the torrent, that my boat was often endangered. Now on these hills there was actually no snow whatever ; and as the rise was obviously caused by the rains, it may reasonably be concluded that the same effect has the same cause in other places.



# IV.

## OBSERVATIONS OF SOME OF THE ECLIPSES OF JUPITER'S SATELLITES.

BY MR. REUBEN BURROW.

*The following in the Ganges and Burampootre Rivers.*

Apparent time 1787.	Satellitc.	Weather.	Im. or Em.	Place of Observation.
Sept. 23 11 41 9	2	Moderate,	Imm.	Bankipore Granary.
24 15 41 22	3	Ditto,	Imm.	Ditto.
Oct. 11 12 45 14	1	Ditto,	Imm.	Colgong; Cleveland's Bungalo.
23 10 26 20	3	Ditto,	Emer.	Mouth of Jellingy.
25 11 47 39	2	Ditto,	Imm.	Shore of Ganges South of Pubna.
25 16 42 40	1	Ditto,	Imm.	Ditto.
27 11 13 59	1	Ditto,	Imm.	Coffiundah; Nullah.
30 14 35 16	3	Ditto,	Emer.	Dacca; Nabob's house.
Nov. 19 8 56 32	2	Ditto,	Imm.	Tealcopec, Burrampooter.
26 11 35 45	2	Ditto,	Imm.	Bakkamar Chorr.
26 13 13 57	1	Ditto,	Imm.	Ditto.
28 7 42 52	1	Ditto,	Imm.	Cazycotta.
Dec. 3 14 10 54	2	Hazy,	Imm.	Goalparah.
3 15 8 1	1	Moderate,	Imm.	Ditto.
5 7 51 59	3	Ditto,	Imm.	Ditto.
5 9 35 26	1	Ditto,	Imm.	Ditto.
10 16 41 54	2	Very Hazy,	Imm.	Budjrapore.
10 16 56 17	1	Moderate,	Imm.	Ditto.
12 11 26 9::	1	Hazy,	Imm.	Tingarchor.
12 11 48 40:	3	Ditto,	Imm.	Ditto.
19 15 28 59	1	Ditto,	Emer.	Luckipore.

*The following on the Arracan Coast.*

Apparent time 1788.	Satellitc.	Weather.	Im. or Em	Place of Observation
Feb. 5 10 18 12:	1	Moderate,	Fmer.	Cheduba, Flag Staff Point.
12 12 13 54	1	A little hazy	Emer.	Ditto, Maykawoody Fort.
21 8 39 29	1	Moderate,	Emer.	Yambeah Ty Fort.
23 10 57 53	2	Ditto,	Emer.	Ditto, Kavaonemo.
28 10 35 13	1	Ditto,	Emer.	Cheduba, Cedar Point.

*The*

*The following were observed at Colonel Hutton's Docks at Kilderpore,  
near the Mouth of the Nullah.*

Apparent time 1854.	Satellit.	Weather.	Im. or Em.	Place of Observation.
Dec. 1 8 30	1	Moderate.	Emer.	
10 7 31	2	Ditto.	Emer.	
22 50 31 30	1	Ditto.	Finer.	
3 7 31 20	1	Ditto.	Finer.	

*The following in the Ganges and Rohilund, &c.*

Apparent time 1854.	Satellit.	Weather.	Im. or Em.	Place of Observation.
Dec. 8 34 30	5	Moderate.	Finer.	Bankipore.
10 31 31	1	Ditto.	Finn.	Benares Observatory.
11 30 32 30	2	Ditto.	Finn.	Chunar Camp.
12 31 31 20	1	Hazy.	Finn.	Ilahabad Fort.
13 31 31 20	1	Ditto.	Finn.	Corraichotta.
20 30 38 28	3	Moderate.	Finn.	In the Ganges 3m below Nudist
21 31 38 28	5	Ditto.	Finn.	Ghat.
21 31 38 28	1	Ditto.	Finn.	Jehanpore.
22 31 31 20	3	Ditto.	Finn.	Cawnpore, Meozim Ghat.
23 31 31 22	5	Ditto.	Finn.	Ditto.
24 30 37 2	1	Ditto.	Finn.	Ditto.
25 30 32 20	2	Ditto.	Finn.	Joongnigpore Ghat.
26 31 31 20	1	Ditto.	Finn.	East of Cawnpore, 08 2 20
27 31 31 20	1	Ditto.	Finn.	Futtighur Magazine.
28 31 31 20	2	Ditto.	Finn.	Ditto, Dr. Cook's Camp.
29 31 31 20	1	Ditto.	Finn.	Ditto.
30 31 31 20	1	Ditto.	Finn.	Ditto.
31 31 31 20	1	Hazy.	Finn.	Cuttaroh.
1 31 31 20	1	Moderate.	Finn.	Ferozpoor.
Feb. 1 31 31 20	2	Ditto.	Finn.	Nabongange.
2 31 31 20	1	Ditto.	Finn.	Pilibhat, Led Ghat.
3 31 31 20	1	Ditto.	Finn.	Shangur.
4 31 31 20	1	Ditto.	Finn.	Bowerkah.
5 31 31 20	1	Ditto.	Finn.	Bhyrah.
6 31 31 20	1	Ditto.	Finn.	Takoorwar.
7 31 31 20	1	Ditto.	Finn.	Nidubabad.
8 31 31 20	1	Hazy.	Finn.	Ditto.
9 31 31 20	5	Moderate.	Finn.	Amroozah.
10 31 31 20	1	Ditto.	Finn.	Ditto.
11 31 31 20	2	Ditto.	Finn.	Hussainpore.
12 31 31 20	1	Hazy.	Finn.	Ditto.
13 31 31 20	1	Ditto.	Finn.	Secrath.
14 31 31 20	1	Ditto.	Finn.	Ditto.
15 31 31 20	1	Ditto.	Finn.	Churdowky.
16 31 31 20	1	Moderate.	Finn.	Futtighur, Dr. Cook's Camp.
17 31 31 20	2	Ditto.	Finn.	Ditto.

Apparent time 1789.	Satellite.	Weather.	Im. or Em.	Place of Observation.
d h m s				
Mar. 11 9 22 21	1	Moderate,	Emerson,	Mobarickpore Gaut.
18 11 23 56	1	Ditto,	Emer.	Chunar Fort.
20 9 4 40	2	Ditto,	Emer.	Benares Observatory.
27 7 59 16	1	Ditto,	Emer.	Bankypore Granary.
27 11 53 1	2	Ditto,	Emer.	Ditto.
29 10 31 10	3	Ditto,	Imm.	Ditto.
April 3 9 56 45;	1	Ditto,	Emer.	Patna ; Chaheluttoo.
10 11 59 48;	1	Very hazy,	Emer.	Mongeer ; Rocky Point.
19 8 30 56	1	Hazy	Emer.	Rajmahal.
26 10 31 22	1	Moderate,	Emer.	Teacally Dumdumna.

*The following were observed at Ruffahpugly, near Calcutta.*

Apparent time 1789.	Satellite.	Weather.	Im. or Em.	Place of Observation.
d h m s				
May 12 8 48 50	1	Moderate,	Emer.	
Dec. 19 11 59 15	1	Hazy	Imm.	
19 14 5 33	3	Ditto,	Imm.	
22 11 23 4	2	Moderate,	Imm.	
26 13 49 38	1	Ditto	Imm.	
1790.				
Jan. 2 15 39 32	1	Ditto,	Imm.	
18 13 49 51	1	Mist & wind,	Imm.	
23 10 44 48	2	Ditto,	Imm.	
24 9 40 57	3	Hazy,	Imm.	
27 10 8 19	1	Moderate,	Imm.	
31 13 36 35	3	Very hazy,	Imm.	
Feb. 1 17 32 48	1	Hazy,	Imm.	
3 12 1 30	1	Moder.	Imm.	
17 10 38 18	2	Ditto,	Emer.	
19 12 33 56	1	Ditto,	Emer.	
26 14 28 38	1	Hazy,	Emer.	
28 8 57 22	1	Moder.	Emer.	
Mar. 1 9 0 52	3	Ditto,	Emer.	
5 16 24 13	1	Hazy,	Emer.	
16 7 18 14	1	Moder.	Emer.	
23 9 14 25	1	Ditto,	Emer.	
26 7 36 11	4	Ditto,	Imm.	

*The two following were at Jowgatta, near Krishnagar.*

Apparent time 1790.	Satellite.	Weather.	Im. or Em.	Places of Observation.
d h m s				
Apr. 22 10 27 30	2	Moderate,	Emer.	
22 11 31 10	1	Ditto,	Emer.	



THOSE to the 31st of March 1788, were observed with a glass made by WATKINS, that magnified about 110 times; those from thence to the 12th of May 1790, were observed with one of RAMSDEN's telescopes, of the sort lately made for the navy; and the remainder with a glass made by DOLLAND, that magnifies about eighty times.

I SHALL conclude these observations with a remark that highly concerns both the buyers and makers of telescopes; namely, that the parts which compose the object-glass of an Achromatic, are generally put together in such a manner that they cannot be taken asunder; and the brass part that they are bedded in, shoots a number of chymical ramifications between the glasses, that in the course of a year renders a telescope of little or no service. This defect the maker may easily remove, by making the compound object-glass capable of being taken to pieces, or the parts in some other substance not liable to this defect.

## V.

A PROOF THAT THE HINDOOS HAD THE  
BINOMIAL THEOREM.

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 BY MR. REUBEN BURROW.
 

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THE *islands* in the *Bay of Bengal*, are many of them covered with shell and marine productions to a great height ; and there are beds of large smooth pebbles near the *Herdwar*, some hundreds of feet above the present level of the *Ganges* ; the sea has therefore gradually been retiring, and consequently the position of the Equator was formerly farther north than it is at present in this part of the earth : and if a few similar observations were made in other countries, it is evident that the ancient situation of the pole upon the surface of the earth might be determined sufficiently near for explaining many difficulties and paradoxes in Geographical Antiquities : for this purpose also it would be advisable to have permanent meridian lines drawn in high northern latitudes, to be compared in succeeding ages ; and also to have marks cut upon rocks in the sea, to shew the proper level of the water.

IN the afore said position of the Equator, the lands of *Tartary* were inhabitable, and the Siberian climates temperate ; the deserts of the *Lesser Bukharia* were then part of the seat of the *Paradise of Moses* ; and the four sacred rivers of *Eden* went through *India*, *China*, *Siberia*, and into the *Caspian Sea*, respectively. This appears from a *Bramm* map of the world,

in the *Sanſcrit* language, which I met with about two years ago in the higher parts of *India*, together with a valuable Treatiſe of Geography upon the ſyſtem of *Boddh*; both of which I communicated, with my idea on the ſubject, to Mr. WILFORD, of the *Bengal* Engineers: and from him the world may expect ſhortly to be favoured with the firſt true representation of Scriptural and *Hindoo* Geography.

FROM the aforeſaid country the *Hindoo* religion probably ſpread over the whole earth: there are ſigns of it in every northern country, and in almoſt every ſyſtem of worſhip. In *England*, it is obvious, Stonehenge is evidently one of the temples of *Boddh*; and the arithmetic, the aſtro-nomy, aſtrology, the holidays, games, names of the ſtars, and figures of the conſtellations; the ancient monuments, laws, and even the languages of the different nations, have the ſtrongeſt marks of the ſame original. The worſhip of the ſun and fire, human and animal ſacrifices, &c. have apparently once been univerſal; the religious ceremonies of the papiffs ſeem in many parts to be a mere ſervile copy of thoſe of the *Goſpigns* and *Fakeers*; the Chriſtian Aſcetics were very little different from their filthy original the *Byraggys*, &c.: even the hell of the northern nations is not at all like the hell of the ſcripture, except in ſome few particulars; but it is ſo ſtriking a likenefs of the hell of the *Hindoos*, that I ſhould not at all be ſurprized if the ſtory of the ſoldier that ſaw it in Saint PATRICK's Purgatory, deſcribed in MATTHEW PARIS's Hiſtory, ſhould hereafter turn out to be a tranſlation of the *Sanſcrit*, with the names changed. The different tenets of *Poperſy* and *Deiſm* have a great ſimilarity to the two doctrines of *Brahma* and *Boddh*; and as the *Bramins* were the authors of the Ptolemaic ſyſtem, ſo the *Boddhiſts* appear to have been the inventors of the ancient *Philolaic* or *Copernican*, as well as of the doctrine of attraction; and probably

bly too the established religion of the *Greeks* and the *Eleusian* mysteries may only be varieties of the two different sects. That the *Druids* of *Britain* were *Bramins*, is beyond the least shadow of a doubt; but that they were all murdered and their sciences lost, is out of the bounds of probability; it is much more likely that they turned schoolmasters, and freemasons, and fortune-tellers; and in this way part of their sciences might easily descend to posterity, as we find they have done. An old paper, said to have been found by *Locke*, bears a considerable degree of internal evidence both of its own antiquity and of this idea; and on this hypothesis it will be easy to account for many difficult matters that perhaps cannot so clearly be done on any other, and particularly of the great similarity between the *Hindoo* sciences and ours. A comparison between our oldest scientific writers and those of the *Hindoos* will set the matter beyond dispute; and fortunately the works of *Bede* carry us twelve hundred years back, which is near enough to the times of the *Druids*, to give hopes of finding there some of their remains. I should have made the comparison myself, but *Bede* is not an author to be met with in this country; however, I compared an Astrolabe in the *Nagry* character (brought by Dr. MACKINNON from *Jynagur*) with CHAUCER's description, and found them to agree most minutely; even the center pin which CHAUCER calls "the horse," has a horse's head upon it in the instrument; therefore if CHAUCER's description should happen to be a translation from *Bede*, it will be a strong argument in favour of the hypothesis; for we then could have nothing from the *Arabians*. What *Bungey* and *Swisset* may contain, will also deserve enquiry; and that the comparison may be the readier made where the books are procurable, I mean very shortly to publish translations of the *Leclawotty* and *Beej Ganeta*, or the Arithmetic and Algebra of the *Hindoos*.

It is much to be feared, however, that many of the best treatises of the *Hindoos* are lost, and that many of those that remain are imperfect. By the help of a *Pundit* I translated part of the *Beej Ganeta* near six years ago, when no *European* but myself, I believe, even suspected that the *Hindoos* had any Algebra; but finding that my copy was imperfect, I deferred completing the translation, in hopes of procuring the remainder. I have since found a small part more, and have seen many copies; but from the plan of the work (which in my opinion is the best way of judging) they still seem all to be imperfect, though the copier generally takes care to put at the end of them, that they are complete. I have the same opinion of the *Leelavatty*, and for the same reason. Indeed, it is obvious that there must have been treatises existing where Algebra was carried much farther; because many of their rules in astronomy are approximations deduced from infinite series, or at least have every appearance of it; such, for instance, as finding the sine from the arc, and the contrary; and finding the angles of a right angled triangle from the hypotenuse and sides, independent of tables of sines; and several others of a similar nature, much more complicated. I have been informed by one of their *Pundits*, that some time ago there were other treatises of Algebra, besides that just mentioned, and much more difficult, though he had not seen them; and therefore, as it is possible they may still be existing, and yet be in danger of perishing very soon, it is much to be wished that people would collect as many of the books of science as possible (their poetry is in no danger) and particularly those of the doctrine of *БООДН*, which perhaps may be met with towards *Thibet*. That many of their best books are depraved and lost, is evident, because there is not now a single book of geometrical elements to be met with; and yet that they had elements not long ago, and apparently more extensive than those of *EUCLID*, is obvious from some

of

of their works of no great antiquity. The same remarks are applicable to their Cosmographical Remains, in some of which there are indications of an astronomy superior to that of the SOORYA SIDDHANT, and such popular treatises.

TILL we can therefore find some of their more superior works, it must be rather from the form and construction of their astronomical tables and rules, and the properties implied in their accidental solutions of questions, &c. that we can judge what they formerly knew, than otherwise. That they were acquainted with a differential method similar to NEWTON'S, I shall give many reasons for believing, in a treatise on the Principles of the *Hindoo* Astronomy, which I began more than three years ago, but was prevented from finishing, by a troublesome and laborious employment that for two years gave me no leisure whatever; and which (though the small time I had to spare since has been employed in writing a comment on the works of NEWTON, and explaining them to a very ingenious native, who is translating them into *Arabic*) I hope ere long to have an opportunity of completing. At present I shall only give an extract of a paper explaining the construction of some tables, which first led me to the idea of their having a differential method; it is part of one out of a number of papers that were written in the latter part of the year 1783 and the beginning of 1784, and of which several copies were taken by different people, and some of them sent to *England*. This particular extract was to investigate the rules at pages 253, 254, and 255 of *Monf. GENTIL'S Voyage*, of which the Author says, "Je n'ai pu savoir sur quels principes cette table est fondée," &c. and is as follows:

"Now, by proceeding in the manner explained in the above-mentioned paper,  
 "to calculate the right ascension and ascensional difference for *Trivelpour*,  
 "and

“ and afterwards taking the differences algebraically, and reducing them to  
 “ puls of a *Gury*, as in the following table, the principles of the method  
 “ will be evident.

S	Obl. Ascens.		First diff. of Obl. Ascension.	Ditto reduced to Puls of a Gury.	Do. farther reduced.
	R. A.	Asc. diff.			
0	0	0—0 0	0		
1	27 54—2 19		27 54—2 19	279—23	256
2	57 49—4 13		29 55—1 54	299—19	280
3	90 0—4 59		32 11—0 46	322— 8	314
4	122 11—4 13		32 11+0 46	322+ 8	330
5	152 6—2 19		29 55+1 54	299+19	318
6	180 0+0 0		27 54+2 19	279+23	302
7	200 54+2 19		27 54+2 19	279+23	302
8	237 49+4 13		29 57+1 54	299+19	318
9	270 0+4 59		32 11+0 46	322+ 8	330
10	302 11+4 13		32 11—0 46	322— 8	314
11	332 6+2 19		29 55—1 54	299—19	280
12	360 0+0 0		27 54—2 19	279—23	256

“ THE fifth and sixth columns sufficiently explain the tables in page  
 “ 253 and 254 of Monf. GENTIL; but there remains a part more diffi-  
 “ cult, namely, why in calculating the *Bauja*,” or the doubles of the first  
 “ differences of the ascensional difference, “  $\frac{2}{3}$  of the length of the shadow  
 “ is taken for the first;  $\frac{1}{4}$  of the first term for the second, and  $\frac{1}{5}$  of the  
 “ first term for the third.” “ The primary reason of taking differences  
 “ here, seems to be that the chords may be nearly equal to the arcs, and  
 “ that,

“ that, by adding of the differences, the arcs themselves may be found  
 “ nearly; the reason will appear from the following investigation: — Let  
 “ N be the equatorial shadow of the *Bramus* in *Bugles*, then 720 the  
 “ length of the *Gnomon*, or twelve *Ongles*, will be to N the shadow as  
 “ radius to the tangent of the latitude; and is thus to the tangent of the  
 “ latitude as the tangent of the declination to the sine of the ascensional  
 “ difference, consequently, 720 is to N as the tangent of declination to  
 “ the sine of the ascensional difference. Now if the declinations for one,  
 “ two, and three signs be substituted in the last proportion, we get the sines  
 “ of the three ascensional differences in terms of N and known quantities,  
 “ and if these values be substituted in the Newtonian form for finding the  
 “ arc from the sine, we get the arcs in parts of the radius, and if each  
 “ of these be multiplied by 3600, and divided by 6,28318, the values come  
 “ out in poles of a *Goria* if N be in *Bugles*, but in parts of a *Goria* if N  
 “ be in *Ongles*; and by taking the doubles we get the values nearly as  
 “ follows:—

Value	Difference	
0,00000 N		
0,33056 N	0,33056 N = $\frac{1}{3}$ N nearly,	the values used by the <i>Bramus</i>
0,50923 N	0,26872 N = $\frac{2}{3}$ of $\frac{1}{3}$ of N nearly,	
0,70860 N	0,10932 N = $\frac{1}{3}$ of $\frac{2}{3}$ of N nearly,	

“ Now because the values in the first column are doubles of the as-  
 “ censional differences for one, two, and three signs, then halves are the  
 “ ascensional differences in parts of a *Goria*, supposing N to be in *Ongles*;  
 “ and if each of these halves be multiplied by sixty, the products, namely  
 “ 9,9168 N, 17,9784 N, and 21,2580 N, will be the sine in poles of a  
 “ *Goria*; and if to get each of these nearly, in round number, the  
 “ whole be multiplied by three, and afterwards divided by three, the



“ three products will be 29,75 N, 53,94 N, and 63,77 N, which are  
 “ nearly equal to thirty N; fifty four N, and sixty four N respectively;  
 “ and hence the foundation of the *Bramin* rule is evident, which directs  
 “ to multiply the equatorial shadow by thirty, fifty-four, and sixty-four,  
 “ respectively, and to divide the products by three for the *Chorardo* in  
 “ puls: and these parts answer to one, two, and three signs of longitude  
 “ from the true equinox, and therefore the *Ayanongsh*, or *Bramin* precession  
 “ of the equinox, must be added to find the intermediate *Chorardo* by pro-  
 “ portion.”

THOUGH the agreement of this investigation with the *Bramin* results, is no proof that the *Hindus* had either the differential method, or Algebra, it gave me at the time a strong suspicion of both; and yet for want of knowing the name that Algebra went by in *Sanscrit*, I was near two years before I found a treatise on it; and even then I should not have known what to enquire for, if it had not come into my mind to ask how they investigated their rules. Of the differential method I have yet met with no regular treatise, but have no doubt whatever that there were such, for the reasons I before hinted at; and I hope others will be more fortunate in their enquiries after it than myself.

WITH respect to the *Binomial Theorem*, the application of it to fractional indices will perhaps remain for ever the exclusive property of NEWTON, but the following question and its solution evidently shew that the *Hindus* understood it in whole numbers to the full as well as BRIGGS, and much better than PASCAL. Dr. HUTTON, in a valuable edition of SHERWIN'S Tables, has lately done justice to BRIGGS; but Mr. WHITCHELL, who some years before pointed out BRIGGS as the undoubted inven-



“ of times the whole may be opened together ; and the sum of all the different times is 255.”

THE demonstration is evident to mathematicians ; for as the second term's coefficient in a general equation shews the sum of the roots, therefore in the  $n$  power of  $1 + 1$ , where every root is unity, the coefficient shews the different *Ones* that can be taken in  $n$  things : also, because the third term's coefficient is the sum of the products of all the different twos of the roots, therefore when each root is unity, the product of each two roots will be unity and therefore the number of units, or the coefficient itself, shews the number of different *twos* that can be taken in  $n$  things. Again, because the fourth term is the sum of the products of the different threes that can be taken among the roots ; therefore, when each root is unity, the product of each three will be unity, and therefore every unit in the fourth will shew a product of three different roots, and consequently the coefficient itself shews all the different *threes* that can be taken in  $n$  things, and so for the rest. I should not have added this, but that I do not know well where to refer to it.

P. S. THERE is an observation perhaps worth remarking with respect to the change of the *PORLUS* ; namely, that the small rock-oysters are generally all dead within about a foot above high water mark. Now possibly naturalists may be able to tell the age of such shells nearly by their appearance ; and if so, a pretty good estimate may be formed of the rate of alteration of the level of the sea in such places where they are ; for I made some astronomical observations on a rock in the fens, near an island about seven miles to the south of the island of *Chedoke*, on the *Asian Craft*, whose top was eighteen feet above high water mark, and the whole rock covered with

with those shells fast grown to it, but all of them dead, except those which were a foot above the high water mark of that day, which was *February 2, 1788*. The shells were evidently altered a little in proportion to their height above the water; but by no means so much as to induce one to believe that the rock had been many years out of it. All the adjacent islands and the coast shewed similar appearances; and therefore it was evidently no partial elevation by subterranean fires, or any thing of that sort. This is also apparent from the island of *Chidake* itself, in which there is a regular succession of sea-beaches and shells more and more decayed to a great height. By a kind of vague estimation from the trees and the coasts and shells, &c. (on which however there is not the least dependence) I supposed that the sea might be subsiding at the rate of about three inches in a year.



## A D D I T I O N.

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PAGE 154. Note. The *gunja*, I find, is the *Abrus* of our botanists, and I venture to describe it from the wild plant, compared with a beautiful drawing of the flower magnified, with which I was favoured by Dr ANDERSON.

### CLASS XVII. Order IV.

CAL. *Perianth* funnel-shaped, indented above.

COR. Cymbiform. *Awning* roundish, pointed, nerved.

*Wings* lanced, shorter than the awning.

*Keel* rather longer than the wings.

STAM. *Filaments* nine, some shorter; united in two sets at the top of a divided, bent, awl-shaped body.

PIST. *Germ* indented in the calyx. *Style* very minute at the bottom of the divided body. *Stigma*, to the naked eye, obtuse; in the microscope feathered.

PER. A legume. *Seeds* spheroidal: black, or white, or indur with black tips.

LEAVES pinnated; some with, some without, an odd leaflet.



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